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—. Rep. Med. Offr Hlth Preston, 1942, 36.
—. Rep. Med. Offr Hlth Staffs., 1942, 36.
—. Rep. Milk Supply, Staffs., 1941, 36.
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ERRATUM

V. B. **14.** p. 391. ABDERHALDEN, R., & ELSAESSER, K. H. (1943). For "The fluid contains about 70 g. nicotinamide per 100 ml.", read "The fluid contains about 70 *ug.* nicotinamide per 100 ml."

REVIEW ARTICLES

(1) " **The Present Position of Phenothiazine as an Anthelmintic** ".

(2) " **Trichomoniasis—A Review of Recent Literature** ".

Reprints (price 1/6 and 2/6 respectively) obtainable from: Central Sales Branch (Imperial Agricultural Bureaux), Penglais, Aberystwyth.

Bulletins on disease subjects written for farmers and " popular " articles of a similar nature are not included in the *Veterinary Bulletin*. Those of a sufficiently important nature are, however, included in *Index Veterinarius*; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin*.

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The Editor will be glad to receive books for review in the *Veterinary Bulletin*.

PLAN OF ARRANGEMENT OF ABSTRACTS IN THE VETERINARY BULLETIN

The following is a guide to the order and position of abstracts in the *Veterinary Bulletin*. It is necessarily limited to key words and frequently occurring items.

Abstracts are suitably numbered and cross-referenced by number among the eighteen different sections.

I. Diseases Caused by Bacteria and Fungi

AEROBES
- Cocci
  - Staphylococci
  - Streptococci
  - Mastitis (under appropriate causal agent)
  - Strangles
  - Micrococci (including Botryomycosis)
  - Vibrios
  - Spirilla
- *Bacillus*
  - Anthrax
- Mycobacteria
  - Tuberculosis
  - Johne's disease
- Corynebacteria
  - Caseous lymphadenitis
  - Ulcerative lymphangitis
- *Pfeifferella mallei* Infection (Glanders)
- *Erysipelothrix rhusiopathae* Infection (Swine Erysipelas)
- *Listerella*
- *Pasteurella*
  - Haemorrhagic septicaemia
- *Pseudomonas*
- *Haemophilus*
- *Proteus*
- Colon-Typhoid Group
- Salmonella Group
  - Infection in mammals
    - Abortion in mares
    - Abortion in ewes
    - Porcine enteritis
    - Other examples
  - Infection in birds
    - Pullorum disease (B.W.D.)
    - Fowl typhoid
    - Other examples
  - Meat poisoning infections
- Brucella Group
  - *Br. abortus*
  - *Br. suis*
  - *Br. melitensis*

ANAEROBES
- Clostridia
  - Blackleg
  - Malignant oedema
  - Braxy, black disease
  - Enterotoxaemia, lamb dysentery, pulpy kidney disease,.etc.
  - Tetanus
  - Botulism
- Vibrios

VARIOUS OTHER UNCLASSIFIED MICRO-ORGANISMS
- *Bartonella*
- *Eperythrozoon*
- *Grahamella*

FUNGI
- *Mucor*
- *Coccidioides*
- *Histoplasma*
- *Cryptococcus* Infection (Epizootic Lymphangitis)
- Ringworm
- *Aspergillus*
- *Actinomyces*
- *Actinobacillus*
- *Fusiformis*

PLEURO-PNEUMONIA GROUP
- Bovine Contagious Pleuro-Pneumonia
- Pleuro-Pneumonia-Like Organisms

AGALACTIA GROUP
- Contagious Agalactia of Goats and Sheep

BACTERIAL FLORA OF ANIMAL TISSUES

METABOLISM AND NUTRITION OF MICRO-ORGANISMS

II. Diseases Caused by Protozoan Parasites

- Amoebiasis
- Trypanosomiasis
- Leishmaniasis
- Trichomoniasis
- Blackhead of Turkeys (*Histomonas meleagridis* Infection)
- Infectious Enteritis of Turkeys (*Hexamita* Infection)
- Coccidiosis
- Malaria
- Piroplasmosis
- Anaplasmosis
- Toxoplasmosis
- Spirochaetosis
  - Leptospirosis

III. Diseases Caused by Viruses and Rickettsia

- Virus Infections not Limited to Single Animal Species
  - Foot and mouth disease
  - Aujeszky's disease
  - Rabies
  - Pox diseases
  - Influenza group
  - Encephalitis group
    - Equine encephalomyelitis
    - Human encephalitis
- Virus Diseases of Equines
  - Respiratory infections
  - Equine infectious anaemia
  - African horse sickness
- Virus Diseases of Cattle
  - Rinderpest
  - Bovine malignant catarrh
- Virus Diseases of Sheep and Goats
  - Bluetongue
  - Contagious ecthyma
  - Louping ill
- Virus Diseases of Swine
  - Swine fever
  - Porcine encephalomyelitis
  - Vesicular exanthema
- Virus Diseases of Carnivora
  - Of dogs
  - Of cats
  - Of foxes
  - Of other carnivora
- Virus Diseases of Rodents
- Virus Diseases of Birds
  - Fowl plague
  - Newcastle disease
  - Respiratory infections
  - Psittacosis
- Virus Diseases of Man
- Rickettsial Infections
  - Heartwater of sheep
  - Rickettsial conjunctivitis
- Bacteriophage

IV. **Immunity**

General Immunology
Immunization and Immunizing Agents (Vaccines, etc.)
Diagnosis and Diagnostic Agents (including Tuberculin, etc.)
Serology
Allergy and Anaphylaxis
Tissue Invasiveness (Permeability)
Various

V. **Parasites in Relation to Disease [General]**

VI. **Parasites in Relation to Disease [Arthropods]**

Lice
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Dipterous Flies
  Blowflies and fleshflies
  Oestrids (warbleflies and botflies)
  Biting muscids (*Stomoxys*, *Lyperosia*, *Glossina*)
  Tabanids
  Midges
  Mosquitoes
  Sheep ked
Pentastomes
  Linguatula
Ticks
Mites

VII. **Parasites in Relation to Disease [Helminths]**

TREMATODES
CESTODES
  Taenia
    Cysticercosis
    Echinococcosis
NEMATODES
  Strongyloides
  Trichurids
    Trichinosis
  Strongyles
    Sclerostomes
    Hookworms
    Parasitic gastro-enteritis
    Lungworms
    Poultry gapeworm
  Oxyurids
  Ascarids
  Spirurids
  Filariae
  Acanthocephala

VIII. **Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis]**

Spontaneous Tumours
Cancer Research
Virus Tumours of Rabbits
Fowl Sarcoma
Fowl Paralysis

IX. **Diseases, General**

General and Collective
Special Animal Pathology—Unclassified Diseases of Particular Animals (Horse, Ox, Sheep, Goat, Pig, Dog, Cat, Rodent, Bird, Various)
Haematology
Special Regional Pathology—Unclassified Diseases of Particular Body Organs (Circulatory, Digestive, Respiratory, Nervous, Skeletal, Urino-Genital, Endocrine Systems etc.)
Histopathology
Inherited Diseases and Lethal Factors
Teratology

X. **Nutritional and Metabolic Disorders**

General Nutrition
Carbohydrates, Fats, Proteins, Amino Acids etc.
Minerals
Osteodystrophia and Rickets
Vitamins (A, D, E, K, B_1, B_2, Nicotinic Acid B_6, Pantothenic Acid, Other Factors of the B_2 Complex, C, Other Vitamins)
Metabolic Disorders

XI. **Physiology, Anatomy and Biochemistry**

General
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Enzymes
Lactation
Normal Haematology and Blood Groups
Regional Physiology (Circulatory, Digestive Respiratory, Nervous, Skeletal, Urino Genital including Breeding and Artificia Insemination and Endocrine Systems)
Wound Healing
Various
Anatomy

XII. **Poisons and Poisoning**

Inorganic
Organic and Alkaloid
Plant Poisons
Poisoning by Ingestion of Arthropods
Venoms
Poisoning by Therapeutic Agents
Miscellaneous, including War Gases

XIII. **Pharmacology, Therapeutics and Disinfectio**

General Chemotherapy and Pharmacology
Treatment of Bacterial and Fungous Disease
Treatment of Protozoan Diseases
Treatment of Virus Diseases
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Treatment of Unclassified Diseases
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Hormone Therapy
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Disinfectants and Antiseptics

XIV. **Hygiene and Public Health**

Milk Hygiene
Meat Hygiene
Food Poisoning
Rodent Control
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XV. **Technique and Apparatus**

Bacteriological
Parasitological
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Zootechny
Various

XVI. **Miscellaneous**

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IMPERIAL BUREAU OF ANIMAL HEALTH

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DISEASES CAUSED BY BACTERIA AND FUNGI

*Ferguson, A. J. (1943). **A bacteriological study of the role of udder injuries in establishing the various infections of bovine mastitis.**—*Thesis, Cornell.* pp. 95. †1

Knowledge of the natural means of transmission of mastitis is very incomplete. The introduction of mastitis organisms into the udder usually results in infection of the gland. External exposures do not induce infection. The intact meatus appears to be an effective barrier to the entrance of bacteria into the udder. Only when the teat is injured does external exposure readily induce infection of the gland. These studies were initiated in an attempt to ascertain the possible role, under field conditions, of udder trauma in inducing mastitis.

Samples of the secretions from 317 udder quarters showing evidences of trauma were taken for bacteriological examination. These quarters were obtained from 276 cows in 119 herds. Only 34 (11%) of the 317 injured udder quarters were not infected. Most of the injuries of the 34 udder quarters which were free from mastitis infection did not appear to involve the teat meatus. Although infection was absent in these quarters, about one-half of the samples were abnormal in appearance, showed a pronounced reaction to the bromthymol blue test, and contained large numbers of cells. Udder trauma in itself may produce disturbances in the gland resembling those resulting from mastitis infections.

Mastitis bacteria were present in 14% of 3,560 unselected udder quarters; 89% of the injured quarters were infected. It appears that injured quarters, particularly if the teat meatus is involved, are likely to be infected.

The results of the bacteriological examinations of 480 cases of chronic, 95 cases of subacute, and 53 cases of acute mastitis are presented. Of the 283 quarters infected following trauma, *Streptococcus agalactiae* was present in 67 (24%), *Str. dysgalactiae* in 65 (23%), *Str. uberis* in 43 (15%), other streptococci in 27 (10%) and staphylococci in 36 (13%). Most of the infections established by udder injury are due to other organisms than *Str. agalactiae* and staphylococci. The role of udder injuries in establishing *Str. agalactiae* infection appears to be limited.—H. L. Gilman (U.S.A.)

Singer, A. J. (1942). **Studies on the staphylococci isolated from animal infections and on the filtrates of toxicogenic staphylococci.**—*Cornell Univ. Abstr. Theses, 1941.* pp. 388–390. 2

The organisms used were isolated from various infections of animals and a few strains of human origin were included. S. found that by using the standard criteria there is no method of distinguishing between the staphylococci involved in different animal diseases nor between those of animal and human origin, and also that there is no relationship between cultural and toxicogenic reactions and pathogenicity of a strain. The work included studies under the following headings.

(1) Regeneration of toxicogenicity in stock strains.—Subcultures on semi-solid stock culture medium showed decreased toxin production, as indicated by haemolysin titre, one year after isolation. Subcultures on 1% starch medium showed increased haemolysin production over the same period in most cases and never showed decreased production; three strains produced detectable haemolysin after subculture on this medium, none having been detected immediately after isolation.

(2) Changes in filtrate potency and pH during prolonged periods of incubation.—During the first 48 hours of incubation, haemolysin production increases rapidly and the pH of the medium slowly increases. Afterwards, the pH increases rapidly and the haemolysin concentration decreases. The addition of 0·2% glucose to the medium by lowering the pH, enhances haemolysin production.

(3) The effect of heat on the toxins at varying pH.—Haemolysin, necrotoxin, and the lethal factor withstand boiling for 30 min. or more in acid medium. In alkaline medium, these substances are rapidly inactivated at boiling temperature.

(4) Reliability of the Dolman test for detecting enterotoxin.—Eighty-seven samples of toxic filtrate were tested on kittens and 45 samples of sterile medium were similarly administered to control kittens. Of those given toxic filtrate, 59·7% vomited and 22·5% of the controls vomited. Statistical analysis showed that to prove that a filtrate is toxic, vomiting should occur in three kittens inoculated successively.

(5) Study of the mechanism of emesis.—Direct application of enterotoxin to the fourth ventricle of the brain of dogs gave no result, indicating that there is no central action on the vomiting centre. The effect on crossed-circulation cats and eviscerated cats showed

* In certain cases it is not possible to check the titles of articles in the original publication. Such titles are marked with an asterisk.
† The serial number printed in black type after each title is intended to help the reader to find quickly all the abstracts on a given subject which appear in any one number of the *Bulletin*. Thus, in order to find in the January number all the abstracts dealing with bacteria and fungi which are, for various reasons, assigned to sections other than "Diseases caused by Bacteria and Fungi", it is necessary only to refer to the list of abstract numbers given in small type at the end of that section (see page 6).

that the enterotoxin stimulates the receptors of the gastro-intestinal tract.

(6) Reaction of chick embryos, rats, and frogs to toxic filtrate.—Application of the toxin to the chorio-allantoic membrane of the developing chick, and the isolated or intact intestinal and stomach muscle of the rat produced no characteristic change. Intraperitoneal injection into the rat produced extensive peritonitis, partially prevented by immune serum. Oral administration in the frog produced no detectable reaction.

—R. M. Loosmore.

Theiss, O. (1943). Untersuchungen über die Differenzierung pathogener Streptokokken von Pferden. **[Differentiation of pathogenic streptococci of horses].** —*Zbl. Bakt. I.* (*Orig.*). **150.** 173–190. **3**

T. examined 220 strains of streptococci isolated from various parts of the respiratory tract of 100 horses. An attempt was made to classify these according to the nature of their growth on blood agar and their fermentation reactions. Special attention was paid to the β-haemolytic strains and an effort was made to differentiate the two most important pathogens *Str. equi* and "*Str. pyogenes animalis*". Owing to the great fluctuation in haemolytic power of many strains, the culture method proved less successful than the fermentation test; the latter method was, moreover, more effective in differentiating the two organisms than serological methods.

Precipitation tests with group-specific sera showed that all the β-haemolytic strains belonged to group C (Seelemann). Other strains of streptococci including α-haemolytic ones, isolated from the upper respiratory tract and, for reasons discussed, regarded as secondary invaders, were examined. An attempt to group them serologically failed, although such evidence as was available suggested that they belonged to group D.

—N. S. Barron.

*Müller. (1942). Milzbrand und Schlachtverbot. **[Anthrax and prohibition of slaughter].**—*Dtsch. SchlachthZtg.* **42.** 279–281. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 556]. **4**

M. discusses the legislation in Germany dealing with the emergency slaughter of animals suspected of being infected with anthrax, pointing out the importance of correct supervision of such cases. In Germany at present, the lay inspector can only prohibit slaughter of such beasts while awaiting the action of the State veterinary inspector, and in the meantime, he can advise those concerned as to precautionary measures. The lay inspector can also ask for notification of death of the animal in order to supervise its disposal. M. suggests that either prohibition of slaughter should be discontinued completely, or should be imposed only where anthrax has recently been diagnosed in a case on the same premises. The lay inspector could be utilized to superintend matters pending the arrival of the State veterinary inspector. Under the present system where there is delay in the arrival of the State veterinary inspector, animals not affected with anthrax may die before his arrival, and in these cases the State must pay compensation. M. concludes that therefore the order prohibiting slaughter should also be suspended in these cases.—R. A. Roper.

*Ramon, G., & Staub, A. (1942). Les nouveaux procédés de vaccination contre le charbon et contre le rouget. **[New immunization procedures for anthrax and swine erysipelas].**—*Rev. Immunol.* **7.** 237–244. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 338]. **5**

For immunization against anthrax, a good spore-producing culture with a virulence equal to that used for the first Pasteurian vaccine was employed, and to this was added 1% of alum or 0·2% of agar. The efficacy of the vaccine was tested on numerous sheep, cattle, goats, and horses. In sheep, protection against virulent anthrax bacilli was obtained within five days.

For immunization against swine erysipelas, a highly attenuated strain of *Erysipelothrix rhusiopathiae* was mixed with agar, and it was found that this could be used for pigs of any age, one injection conferring immunity. The addition of alum or agar was considered to increase the immunizing value of the vaccines.

—U. F. Richardson.

*Verge, J., & Senthille, F. (1942). Nouvelles acquisitions sur l'étiologie et la pathogénie de la tuberculose des carnivores domestiques. **[TB. in domestic Carnivora].**—*Rec. Méd. vét.* **118.** 49–69. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 117]. **6**

A study of the literature and of cases examined by the authors indicated that TB. in the dog is most frequently due to human type bacilli, infection being by air-borne organisms originating from tuberculous human beings. Canine TB. originating from infected bovine milk or offal was found to be relatively rare. On the other hand, TB. in cats appeared to be almost exclusively due to bovine type infection of alimentary origin.—J. Lochiel McGirr.

Olsen, H. C. (1943). **The fight against tuberculosis in Bornholm.**—*Acta tuberc. scand.* Suppl. No. 11. pp. 81. [In English]. [Author's summary copied *verbatim*]. **7**

Bornholm is a Danish island in the Baltic, 588 sq. kilometres in area and with 46,500 inhabitants.

A historical description is given of tuberculosis in Bornholm and the fight against it during the past century or so. In Rønne, the largest town, there were 24·6 deaths from tuberculosis in every 10,000 inhabitants at the beginning of the 19th century, but by the beginning of the 20th century the figure had risen to 29·1, to fall to 4·8 in the last five-year period 1936–40.

The decline in tuberculosis in the present century has been recorded in jerks and starts, as every large-scale measure taken to combat tuberculosis has been effective and followed by a fall in the number of fresh cases and deaths. In the period 1906–10 for the whole of Bornholm the number of notifications was 21·0 per 10,000 of the population, in 1936–1940 it was 5·8, and in the same periods the deaths fell from 8·8 to 2·8.

The activities of the dispensary, its method of working, environment investigations, series examinations, school and young people's inspections, are described. Since 1936 BCG-vaccination has been carried out round about all sources of infection, as well as propaganda to induce all young people leaving the island for more infected areas to submit to vaccination, and since 1940 a start has been made with the vaccination of all children leaving school.

In a five-year school-children's and young people's examination the whole population of the island between the ages of 7 and 35 was invited for examination by means of tuberculin test, X-ray examination of all positives, and sputum and gastric lavage tests of all suspects. For the children the percentage reporting was 96·0, for the adults it was 71·1. The curve drawn on 17,000 observations is very flat but shows a rise after the compulsory school age. An examination of hospitalized cases in all ages gives a tuberculin-positive curve with a peak at about the age of 55, whereafter it falls again. The percentage of tuberculin-positives is highest in those age groups where environment changes are most frequent.

Tuberculin-negatives are infected more frequently than tuberculin-positives. Tuberculosis is most wide-

spread in the socially poorest classes, among unemployed and mentally deficient, and among those who are subjected to the greatest changes in environment, those who travel much or in other ways mix with many people.

An account is given of the route of infection for the cases of tuberculosis during the past five years, and it is shown that gastric bacilli carriers are contagious.

It transpires that gradually as tuberculosis has declined, the average age of patients on notification and at death has become lower. In the curve of distribution the average age more and more reaches the peak, due to the fact that fewer children and old people are infected.

Together with the decrease in pulmonary tuberculosis a corresponding decrease has been found in the number of extrapulmonal cases.

Since 1935 bovine tuberculosis has been eradicated in Bornholm by means of a large-scale isolation campaign under the direction of the dairy groups.

Tuberculosis has been fought energetically by tracking the cases down, vaccinating the tuberculin-negative, isolating the sick, and treating with all the methods of today. By these means tuberculosis has declined, and there is reason for hoping that it will continue to do so in the future if the dispensary work is persisted in, as all the curves point downwards and all the figures are getting lower and lower.

Can tuberculosis be completely eradicated under these circumstances? If we can isolate and treat all sources of infection the disease will die out. The fight against bovine tuberculosis has proved it. This can hardly be done, however. Then there is vaccination to fall back upon, and it is possible that in time this will give the desired result in a separate community like that in Bornholm. In an entire country, in the cities and in the large states, however, getting right to the bottom is scarcely possible, and the infection in the surrounding world is always a danger. In order to get at the root of tuberculosis it is necessary to understand where its springs arise. From some crater in the depths of society among the most wretched poverty and misery, unemployment and imbecility, the fountain of tuberculosis infection is thrown up through the community and seizes upon all who are susceptible. Until these social evils can be got under control we shall never be quite free of tuberculosis. Until then we shall not deserve to be, and until then perhaps we shall be unable to do without it. Still, the present work has shown that much can be done.

TEGSTRÖM, A. (1942). **A case of accidental laboratory tuberculous eye infection.**—*Acta tuberc. scand.* **16.** 330–333. [In English]. **8**

Infection was caused by a droplet of pus which, during a P.M. examination of an infected g. pig, accidentally entered an eye of the worker. Local symptoms, including the development of an ulcer on the nasal part of the tarsus, appeared 24 days later, and infection of the eye with human type tubercle bacilli was confirmed. The condition responded satisfactorily to treatment with Finsen rays.—G. J.

MEDLAR, E. M., & SASANO, K. T. (1944). **Ingestion tuberculosis in normal and in vaccinated rabbits. "Haematogenous pulmonary tuberculosis" in man considered.**—*Amer. Rev. Tuberc.* **49.** 78–93. [Spanish summary]. [Authors' conclusions copied *verbatim*]. **9**

No evidence was obtained that intestinal tuberculosis can be produced in the rabbit unless the bacilli are ingested. The usual site for these lesions was in the lymphoid tissue of the appendix and ileocaecal juncture.

Intestinal tuberculosis can be consistently produced in the normal adult rabbit if a sufficiently large number of bacilli is ingested. The infection introduced through feeding invariably terminates in a generalized disease with the lungs being the organs hardest hit.

Vaccinated rabbits were able, in a high percentage of instances, to overcome an "ingestion" dosage that uniformly proved fatal to normal animals. Over half of the animals revealed no lesions at necropsy and, of those that had lesions, only 14 per cent died from a generalized tuberculous infection. Intestinal tuberculosis can exist for thirty-three months in a rabbit without the animal appearing to be ill.

Confinement of the vaccinated animals to a "slum" environment did not appear to influence the course of the disease.

The problems of vaccination, of "haematogenous pulmonary tuberculosis" and of intestinal tuberculosis in man are discussed in relation to the data derived from animal experiments.

POTTENGER, J. E. (1942). **Serial inoculation of guinea-pigs for the demonstration of Mycobacterium tuberculosis.**—*Amer. J. clin. Path.* **12.** 412–415. **10**

It has been shown by several workers that examination of single 24-hour specimens of sputum from tuberculous human patients may fail to reveal bacilli, although these may be found in serial 24-hour specimens. In 1935, P. adopted as a routine procedure in diagnosis, the inoculation of five successive three-day specimens into a single g. pig, the sites of inoculation being successively the right and left axillae, left and right inguinal, and left or right abdominal wall. Of 51 such serially inoculated g. pigs, 1 gave a positive reaction in 4 sites, 4 in 3, 21 in 2, and 25 in 1 only.

Thus this method yielded a higher degree of accuracy in demonstrating tubercle bacilli.—H. I. FIELD.

STEINBACH, M. M., DUCA, C. J., & MOLOMUT, N. (1944). **Experimental tuberculosis in hypophysectomized rats.**—*Amer. Rev. Tuberc.* 49. 105–108. [Spanish summary]. **11**

Albino rats, subjected to hypophysectomy and infected with a bovine strain of *Mycobacterium tuberculosis*, were more heavily infected 28–35 days later than intact rats.—J. M. PETERS.

SCHAIN, P. (1944). **Virulence of tubercle bacilli. An *in vitro* method for its estimation.**—*Amer. Rev. Tuberc.* **49.** 551–555. [Spanish summary]. **12**

An *in vitro* method is described of testing the virulence of acid-fast bacilli by the extent to which they are inhibited by diphtheria antitoxin. Each of 21 strains of acid-fast bacilli of known degrees of virulence for g. pigs was sown on potato-glycerin-blood agar containing 18 concentrations of diphtheria antitoxin of 20–125 units per tube. The inoculum in each case was adjusted to contain 0·66 mg. dry weight in 0·5 ml. of suspension. Growth was studied after 4–6 weeks' incubation. S. concludes that the virulence of the acid-fast bacilli is inversely proportional to the amount of antitoxin necessary to inhibit their growth and that, by this method, they may be divided into three groups :– (1) virulent tubercle bacilli—inhibited in concentrations of 30–50 units ; (2) avirulent tubercle bacilli—inhibited in concentrations of 75–90 units, and (3) acid-fast saprophytes such as *Mycobacterium phlei* and *Mycobact. smegmatis*—not appreciably inhibited in concentrations up to 125 units.—R. M. LOOSMORE.

KROPP, G. V., & FOLEY, J. A. (1944). **Studies on a polysaccharide from the tubercle bacillus.**—*J. Lab. clin. Med.* **29.** 231–240. **13**

The fraction used in the tests described in this paper was a polysaccharide, claimed to be protein-free, isolated from an aqueous extract of tubercle bacilli.

[Little or no information regarding the mode of preparation and chemical nature of the fraction is given.] Its toxicity, serological and antigenic activity, capacity to elicit skin reactions, and effect on white blood cell counts were tested in normal and tuberculous human beings and g. pigs.

The results obtained indicated (a) that intraperitoneal doses of 20 mg. were lethal in tuberculous g. pigs; (b) that the amounts used in tuberculous and non-tuberculous human beings were innocuous (maximum employed 0·3 mg.); (c) that intracutaneous injections in tuberculous human beings increased the lymphocyte and reduced the monocyte count of the blood; (d) that human beings who had received 12 weekly injections of 0·001–0·3 mg. developed homologous antibodies and that the antibodies formed were capable of protecting tuberculous g. pigs against lethal doses of polysaccharide; (e) that the sera of non-polysaccharide-treated tuberculous patients would, in some cases, protect tuberculous g. pigs against lethal doses of polysaccharide, and (f) that the skin reactions produced by the polysaccharide differed in time of appearance and duration from those produced by ordinary protein tuberculins.

—J. Lochiel McGirr.

I. Mayer, J. H., & Finlayson, M. H. (1944). **Chronic melioidosis: a case showing bone and pulmonary lesions.**—*J. R. Army med. Cps.* **82.** 4–13. **14**

II. —. (1944). **Glanders and tuberculosis.**—*Ibid.* 40–41. **15**

A case of chronic melioidosis is described in a European. The authors have been able to trace only five other recorded cases showing a somewhat similar chronic course. They suggest that Europeans may be more resistant to the disease than Asiatics. It was 2¾ years before the true aetiology in this case was established. Subcutaneous injection of 0·2 ml. of 1 : 10 mallein gave no specific reaction. The mode of infection is uncertain; water contaminated by rats or perhaps infection during tattooing are considered as possible causes.

II. This editorial stresses the analogy between those diseases which may run a very chronic or even latent course in one set of circumstances, and yet in another may be most acute. Environment, and as yet little understood immunological factors, all play a part. The diseases discussed are TB., glanders, and melioidosis.—R. Coombs.

*van Rij, B. M. (1942). Twee gevallen van varkensvlekziekte (erysipeloid). [**Two cases of infection in human beings with** *Erysipelothrix rhusiopathiae*].—*Ned. Tijdschr. Geneesk.* **86.** 1354–1355. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 344]. **16**

Two cases of wound infection in man with the bacillus of swine erysipelas are recorded. There was no history of contact with pig products.—U. F. R.

*de Blieck, L., & Jansen, J. (1942). [**Listeriasis in piglets**].—*Tijdschr. Diergeneesk.* p. 573. [Abst. from abst. in *Dtsch. tierärztl. Wschr. /Tierärztl. Rdsch.* **51/49.** 56]. **17**

Listeria infection occurred in piglets which died at about five days old and the organism was isolated from the liver and spleen. Two out of three piglets inoculated intracerebrally from cultures died of septicaemia. Mice, rats, g. pigs, rabbits, and canaries were artificially infected with cultures from these cases.

—Ann F. Russell.

I. *Lilleengen, K. (1942). Listerellos hos tjäder. [**Listeriasis in capercailzie**]. pp. 39. Uppsala: Sv. Jägareförb bundet meddelande 5. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 494]. **18**

II. *Lilleengen, K. (1942). Listerellos hos tjäder. [**Listeriasis in capercailzie**].—*Svensk VetTidskr.* p. 56. [Abst. from abst. in *Skand. VetTidskr.* **32.** 458 & 459]. **19**

I. This is mostly a review of the literature on listeriasis together with an account of the isolation of *Listeria monocytogenes* from a dead capercailzie hen kept at a game-bird breeding centre in Sweden. The organism was found to be pathogenic for rabbits, g. pigs, mice, pigeons, and capercailzie. No toxin was formed *in vitro*. A strongly agglutinating antiserum was obtained by the immunization of a rabbit.

II. P.M. changes in a dead capercailzie included a light grey liver, swollen spleen and small ulcers in the caecal mucosa. The organism was recovered from the liver and blood.

In artificially infected mice, rabbits, and g. pigs, necrotic foci appeared in the liver, spleen, and adrenal glands. Non-purulent encephalitis was observed in an infected rabbit and necrotic foci in the heart of an infected capercailzie.—J. E.

Bert, F. (1943). Gehäuftes Auftreten von Gärtnerinfektionen in einem Rinderbestande mit einem Abortusfall. [**Frequent cases of** *Salmonella dublin* **infection with abortion in a herd of cattle**].—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 11–12. **20**

An aborted foetus was examined from a herd where frequent cases of abortion were occurring at 4–5 months and where it was becoming more and more difficult to get animals in calf. The placenta of the aborted foetus was observed to be oedematous, yellowish or grey, and to be streaked with pus-like material. The subcutis of the foetus was markedly oedematous and the stomach contents were blood-stained and contained numerous yellow flakes. Although brucellosis was suspected, *Brucella abortus* was not found. A salmonella organism was, however, isolated in pure culture and identified as *S. dublin*. Every animal in the herd was then blood tested and faeces, together with 35 milk samples, were examined bacteriologically. Five adult animals were found to be excreting *S. dublin*; three were cows which had recently aborted. Three out of ten calves examined were also shedding the organism. In all the cows which were found to be shedding the organism in the faeces, there was a blood titre of 1 : 400–1 : 6,400, as well as in seven animals which were not excreting it. One cow which had recently aborted showed also a positive *Br. abortus* blood titre.

The clinical picture and P.M. appearances observed in calves are described, and the importance of the disease from the public health point of view is stressed.

—N. S. Barron

*Willems, A. E. R. (1942). [**Septicaemia in a newborn foal caused by a salmonella**].—*Vlaam. Diergeneesk. Tijdschr.* **11.** 137–139. [Abst. from abst. in *Wien. tierärztl. Mschr.* **30.** 147]. **21**

The P.M. changes are described in a foal which had died, a few days after birth, from salmonella septicaemia. The lesions consisted of slight haemorrhagic inflammation of the intestine with stasis and petechiae of the myocardium, and slight cirrhosis of the liver; none of the joints, however, showed any abnormalities. The Gram-negative organism isolated from the blood and organs proved to be a salmonella of Kauffmann's group C. Cultural, biochemical and serological tests are referred to in some detail.—N. S. Barron.

*Spierling. (1942). Das ansteckende Verkalben in der Praxis. [**Bovine contagious abortion**].—*Tierärztl. Rdsch.* pp. 403–405. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 346]. **22**

The majority of animals become infected at pasture through licking. In stalled cattle the disease tends to take a chronic course. Chronic abortion is maintained by the introduction of bought-in animals when they are pregnant, thus creating conditions favourable to the persistence of infection. S. is opposed to the separation of young animals from the adults.—U. F. RICHARDSON.

DANKS, A. G. (1943). *Brucella abortus* **strain 19 and orchitis in a bull.**—*Cornell Vet.* **33.** 381–382. **23**

A bull about 18 months old and bred in a brucella-free herd had been vaccinated with strain 19 when six months old. The bull was used for service four months after vaccination and was fertile. A few months later the animal became relatively inactive and it was observed that the right testicle was swollen. The swelling increased and became hot and painful and the blood serum reacted to *Br. abortus* at 1 : 1,600. Later the testicle was removed, and on examination it was found that there was increased fibrous tissue in it and in the cord; cultural tests and g. pig inoculation from the testicle and epididymis all yielded cultures of *Br. abortus* Because these grew readily in air and because of the absence of gross lesions in inoculated g. pigs, it was concluded that the organism concerned was strain 19.

—S. J. GILBERT.

HUTCHINGS, L. S., & HUDDLESON, I. F. (1943). **Determination of the number of Brucella abortus organisms required to infect guinea pigs and cattle.**—*Amer. J. vet. Res.* **4.** 155–161. **24**

The relative value of several diluting fluids for the suspension of *Br. abortus* organisms was tested and it was found that a 0·1% tryptose in 0·5% sodium chloride solution (pH 6·9) gave constant results when plate counts were made at suitable dilutions.

For the establishment of infection in g. pigs, as judged 30 days after inoculation by the presence of the organism in the spleen or liver, together with macroscopic lesions and a blood agglutination titre, a dose of 10–100 organisms injected subcutaneously was necessary when ordinary *Br. abortus* strains were used. Passage of the strain through g. pigs appeared to enhance its virulence and to produce more extensive lesions and higher agglutination titres in the infected g. pigs. With strain 19, however, a dose of nearly five million organisms was necessary before infection could be observed in g. pigs killed 30 days after inoculation.

Five million ordinary *Br. abortus* organisms instilled into the conjunctival sac of pregnant heifers were found to be sufficient to produce abortion and infection.—B. W.

*VAN DER HOEDEN, J. (1941). **A tropin-reaction for the diagnosis of brucellosis.**—*Antonie van Leeuwenhoek ned. Tijdschr. Hyg. Microbiol.* **7.** 211–219. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 346]. **25**

A serum reaction for the routine diagnosis of brucella infection in man and animals is described. The reaction is based on the thermostability of the specific tropin in contrast to the non-specific tropin which is thermolabile. This test is valuable in the diagnosis of latent infections if made in conjunction with the agglutination and complement-fixations tests.

—U. F. RICHARDSON.

WINTHER, O., & HANSEN, A. C. (1943). Undersøgelser over Abortus-Bang-Ringprøven. [**Research on *Brucella abortus* ring tests**].—*Maanedsskr. Dyrlaeger.* **55.** 401–416. **26**

A discussion with details of the results obtained in a comparative study of Fleischhauer's ring test and the tube agglutination test for *Br. abortus* in milk samples; the technique used is described in detail. 548 samples of mixed milk and 254 individual samples were tested by both methods and in each case more positive results were obtained with the ring test than with the aggln. test. [The figures are hardly worth quoting as so much depended on interpretations in which criteria of five degrees between strongly positive and undoubtedly negative reactions were adopted.]

The conclusion is that the ring test is at least as reliable as the tube test and that it has much to recommend it as a routine test because it can be carried out much more quickly.—J. E.

*WEITZENBERG, R. (1942). Zur Entstehung der Bang-infektion beim Menschen. [**Origin of human *Brucella abortus* infection**].—*Berl. Münch. tierärztl. Wschr.* pp. 297–299. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 345]. **27**

The various views on the epidemiology of undulant fever are discussed, and an outbreak which W. observed is ascribed to depression of the defence mechanism combined with exposure to infection. It is suggested that the same factors may play an important part in bovine infection.—U. F. RICHARDSON.

*HAAGEN, E. (1943). Die Übertragung der Bangschen Krankheit und die Frage von Zweiterkrankungen. [**Transmission of human *Brucella abortus* infection and the question of reinfection**].—*Dtsch. med. Wschr.* p. 521. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 345]. **28**

The question whether human beings are subject to repeated infections with undulant fever is discussed, and it is argued that in a proportion of cases no true immunity develops, but that an allergic condition or chronic infection exists without the appearance of any demonstrable antibody. A latent infection with liability to relapse must be presumed.

Milk and milk products are discussed as sources of infection.—U. F. RICHARDSON.

*ALTHOFF, H., & RATING, B. (1943). Über Lungenveränderungen beim Morbus Bang. [**Lung lesions in undulant fever**].—*Klin. Wschr.* pp. 597–598. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 345]. **29**

Two illustrations show that in undulant fever an infiltration of the lungs may occur, the condition being usually symptomless and only recognizable by means of X-rays, but sometimes developing to a condition simulating pleuro-pneumonia. This infiltration is considered to be specific on account of the symptomatology, pathologic anatomy, and the response to treatment.

—U. F. RICHARDSON.

*PYRGIALIS, A. (1943). Über eine neue und sichere diagnostische Methode des Maltafiebers. [**A new method for the diagnosis of undulant fever**].—*Münch. med. Wschr.* pp. 534–535. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 344]. **30**

It was found that the intravenous injection of 5–10 million organisms of a *Brucella melitensis* vaccine (Belfanti-Milan) into cases of undulant fever produced a febrile reaction, whilst this reaction was not given in other fevers, cancer cases, cases of TB. or syphilis, or by healthy adults. It is claimed that this reaction provides a quick specific method of confirming the diagnosis in cases of suspected undulant fever.

—U. F. RICHARDSON.

*CATTANEO, A. (1943). Ulteriori ricerche sulla medullocultura nella brucellosi. [**Culture of brucella from the bone marrow**].—*Boll. Ist. sieroter. Milano.* **22.** 5–8. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 345]. **31**

The superiority of culture from bone marrow over blood culture for the diagnosis of undulant fever was demonstrated in 51 cases, 86·2% being positive on

bone-marrow culture and only 15·7% on blood culture. In addition, C. established that some patients who have clinically recovered, and been discharged as cured, may give a positive result to marrow culture. Three cases are mentioned in which the organism disappeared from the bone marrow, but was later recovered from a vertebra or from joints. C. considers these to be cases of local relapses, and not to be of a septicaemic character as are those in which the bone marrow becomes positive again after the first disappearance of fever.—U. F. RICHARDSON.

HELL, K. A. (1943). Lippennekrobazillose bei Pferden. [*Fusiformis necrophorus* **infection of the lip in horses**].—*Z. Veterinärk.* **55.** 25–27. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 349]. **32**

An outbreak of lip necrosis occurred in 700 army horses, 80 animals being involved. Forty-five showed severe necrosis of both the upper and lower lips, whilst 35 animals had abscess of the lips or small necrotic lesions. There were no febrile symptoms; appetite was maintained unless the necrosis was so severe as to interfere with mastication, and recovery took place in 2–3 weeks. Two animals died, and P.M. examination revealed nodules in the lungs and thoracic lymph nodes, varying from the size of a pea to that of a hen's egg. These nodules contained a greyish-yellow material about the consistency of cacao butter. *Fusiformis necrophorus* was isolated in pure culture from the lesions, and it is concluded that the soil of the area must have been heavily contaminated with this organism.—U. F. RICHARDSON.

*MEIDLINGER, J. (1940). Einfluss der Härte des Wassers auf die Lebensfähigkeit einiger pathogener Mikroben. [**Influence of the hardness of the water on the viability of pathogenic bacteria**].—*Inaug. Diss., Vienna.* [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **143.** 452]. **33**

The viability and growth of *Bacterium coli, Salmonella suipestifer,* and *S. paratyphi* B. is enhanced in hard water but lessened by soft water; distilled water is still less favourable. The degree of hardness of the water has no effect on the sterilizing power of ultra-violet rays, but hard water lowers the efficiency of perchloride of mercury and lysoform as disinfectants.

—ANN F. RUSSELL.

I. MEYER, K. (1944). **The relationship of lysozyme to avidin.**—*Science.* **99.** 391–392. **34**

II. LAURENCE, W. L. (1944). **On the possible identity of "avidin" and eggwhite lysozyme.**—*Ibid.* 392–393. **35**

I. In a study of the relationship of avidin and lysozyme in which seven avidin preparations were tested for lysozyme activity against *Micrococcus lysodeikticus* and *Sarcina lutea,* it was found that avidin activity, varying from 60–5,200 units per g., was proportional to lysozyme activity, varying from 4–160 units per mg.

Tests of the action of biotin on the lytic action of lysozyme showed that addition of 10 μg. of biotin increased the activity of lysozyme, both against live and acetone-ether killed and extracted organisms, from 8–250 times. The effect was even more marked if incomplete lysis was taken as the endpoint.

M. cannot explain these results at the present time and suggests that biotin might be considered as the prosthetic group of a protein carrier; this protein carrier would bind biotin, while the biotin-avidin complex would have lysozyme activity. All attempts to dissociate lysozyme into carrier and prosthetic groups have so far failed. The results, however, do definitely link biotin with lysozyme, a mucolytic enzyme concerned with defence against bacterial invasion.

II. Investigations in which (a) a sample of brown egg-white lysozyme was tested for avidin activity, and (b) samples of avidin of known varying potencies were tested for lysozyme activity gave strongly positive results for both (a) and (b) and also showed that the avidin activity in each avidin concentrate closely paralleled its lysozyme activity.

These data on the interchangeable activities of avidin and lysozyme, together with the data obtained by MEYER [see I] throw a new light on avidin and suggest that free avidin rather than being "anti-biotin" may serve as a biotin-carrier and thus may be more properly termed a "pro-biotin". The so-called "toxic effect" of avidin may be due to other reasons such as molecular size resulting in non-absorption from the gastro-intestinal tract.—R. ALLCROFT.

See also absts. **75** (streptococcus), **74, 75** (pneumococcus), **71, 79, 80, 176, 177, 198, 204, 205, 228-232** (TB.), **196, 208** (Johne's disease), **113** (pasteurella), **206** (*Haemophilus influenzae*), **74** (*Bact. coli*), **110** (salmonella), **233** (pullorum disease in Manioba), **73, 95** (brucella), **191** (gas gangrene), **199** (botulism), **196** (actinomycosis, actinobacillosis), **111** (*Fusiformis necrophorus*), **169, 170** (antibacterial agents), **201-207** (cultivation of bacteria).

DISEASES CAUSED BY PROTOZOAN PARASITES

LAVIER, G. (1943). L'évolution de la morphologie dans le genre *Trypanosoma.* [**Evolution of morphology in the genus** *Trypanosoma*].—*Ann. Parasit. hum. comp.* **19.** 168–200. **36**

The classification of trypanosomes is discussed, and it is pointed out that attempts to subdivide the genus *Trypanosoma* have not been satisfactory. Wenyon's division into groups based on the mode of transmission and method of evolution in the invertebrate, may be satisfactory from the medical and veterinary point of view, but is not considered sound zoologically. Systems based on the morphology of the organisms in the vertebrate host raise the question as to whether the vertebrate or invertebrate host is the primary and more important one. It seems that the vertebrate is the primary host, since very similar trypanosomes may be transmitted by very different vectors. Moreover, whilst their behaviour in the vertebrate is relatively constant, their evolution in the vectors is very varied, although the standard type is that of development in the alimentary tract with infection by the contaminative method.

It seems, therefore, that the primary base for classification should be the morphology in the vertebrate. In many trypanosome infections, however, there is an early stage of young dividing forms, and a later stage of "adult forms", and it is only the latter which show the full developmental structure. The pathogenic trypanosomes of mammals differ from the other trypanosome species, not so much on account of their pathogenicity, as because of the absence of an "adult form".

Reviewing the morphology of these "adult forms", L. concludes that five main groups can be distinguished. Group (1) occurs in fish, with slightly modified forms in urodeles and chelonians. Group (2) occurs in reptiles and anurans, but extends to birds and mammals. Group (3) occurs in anurans and saurians. Group (4) occurs in birds, but a similar smaller form occurs in

mammals. Group (5) occurs in mammals, being typified by *T. lewisi* and including *T. cruzi*. [The mammalian species in groups (2) and (4) are not named.]

The remaining pathogenic trypanosomes of mammals [see also LAVIER—*V. B.* **14.** 298.] are distinguished by three characteristics, namely that they continue to multiply throughout the whole course of the infection, that they are capable of infecting hosts of widely separated species, and that, if there is an invertebrate vector, infection is not contaminative. From the point of view of morphology they do not form a homogeneous group. *T. vivax* has a cyclical development in tsetse flies, but can be transmitted by other biting insects. It occurs in Africa, South America, and possibly Asia, though it has not been recorded there. It is speculated that it may have originated in some extinct ungulate, become pathogenic, developed the power of infecting numerous species of hosts, lost its connexion with its original vector, in the alimentary tract of which it underwent cyclical development, and acquired the ability to develop in the mouth parts of tsetses.

T. congolense appears to be closely but not entirely bound to the tsetse fly; it has been reported from only two places where these flies do not exist, *viz*, Zanzibar and once from India. It is suggested that it may have developed from a species of group (2), which developed pathogenicity and at the same time became incompletely adapted to transmission by tsetse fly.

It is suggested that the *T. brucei*, *T. evansi*, *T. equiperdum* group probably originated in an ungulate, developed pathogenicity, and became capable of transmission by coitus due to their occurrence in genital oedemas, or by flies due to their occurrence in the peripheral blood; *T. brucei* has a special adaptation to tsetse flies where it has come into contact with these insects.—U. F. RICHARDSON.

NEITZ, W. O. (1943). **The aetiology of East Coast fever.**—*J. S. Afr. vet. med. Ass.* **14.** 39–46. **37**

The object of this article is to point out several characteristics of the disease which seem to indicate that it cannot be considered purely as a protozoan disease. During Theiler's experiments in 1912 on immunization against E.C.F. with spleen and lymph-node emulsions, it was observed that in some cases only mild reactions occurred without any parasites being demonstrated, whilst some animals did not react and no parasites could be demonstrated. When immunity trials on these animals were made by infestation with infected ticks, nearly 50% of them failed to become infected. The same result was again obtained later, in the extensive inoculation campaigns undertaken under field conditions, when a big percentage of non-reactors resisted infection on exposure. This "sterile immunity" in E.C.F. is unusual in a disease caused by a protozoan. N. therefore suggests that two factors are concerned in infection in this disease, *Theileria parva* and another disease-producing entity, very possibly a virus. To support his theory, he mentions that in cattle which develop *T. mutans* infection as a result of exposure to tick infection, he was able to observe that ticks fed on the animals contained, in addition to the *Theileria*, a "virus", since their bites produced febrile reactions in sheep although no parasites could be demonstrated. —E. M. ROBINSON (S. AFRICA).

SERGENT, ED. (1941). Aegyptianella pullorum Carpano, 1929 = Aegyptianella granulosa penetrans (Balfour, 1911) chez de caille, Coturnix coturnix coturnix (L.) en Algérie. [*Aegyptianella pullorum* **infection in quail in Algeria**].—*Arch. Inst. Pasteur Algér.* **19.** 26–28. **38**

Natural infections with *A. pullorum* have been observed in quail in Algeria. Stained preparations of the parasites show a circular arrangement of chromatin and a central colourless vacuole. The circle is usually made up of a series of deeply tinted granules united by pale pink chromatin. The parasite never displaces the nucleus of the parasitized red cell, and exhibits no evidence of pigment. Schizogony is occasionally obscured. The merozoites are arranged around the circumference of the circle or distributed throughout the vacuole. A residual body is visible in the vacuole of most schizonts. Infected quail showed no other blood parasites.—C. HORTON SMITH.

PETERSEN, C. B. (1944). **Leptospira ballum. A new serological leptospira type?**—*Acta path. microbiol. scand.* **21.** 504–509. [In English]. [Author's summary copied *verbatim*]. **39**

From the urine of a mouse (Mus musculus spicilegus) a leptospira strain "Mus 127" was isolated and found to differ serologically from all the serological leptospira types established so far, perhaps with exception of Mino's [1941] type poi and the two English strains described by Gardner [*V. B.* **14.** 7.] and Vincent, with which it could not be compared under the present conditions. As the preliminary name for the type represented by "Mus 127", *L. ballum* is suggested—after the place where this strain originated from.

The virulence of *L. ballum* for young guinea-pigs is of the same magnitude as that of *L. icterohaemorrhagiae*, but jaundice occurs considerably less frequently in leptospirosis ballum than in leptospirosis icterohaemorrhagiae.

The virulence of *L. ballum* for young white rats and mice appears to be only slight, but so far only a few experiments of this kind have been made. The infected animals became leptospira carriers.

Infection of man with *L. ballum* has not been ascertained so far.

BABUDIERI, B. (1943). Das Ueberleben von Leptospiren auf Serum- und Blutnährböden. [**Viability of leptospira on serum and blood media**].—*Zbl. Bakt. I.* (*Orig.*). **150.** 243–246. **40**

In tests of the viability of a number of leptospiral strains in various media, it was not found that the substitution of g. pig blood for rabbit serum gave any increase in the period of survival. It was concluded that Korthof's medium is the most satisfactory, but that subcultures should be made at intervals of not more than 2–3 months.—U. F. RICHARDSON.

VAN DEN BERGHE, L. (1942). Sur la présence d'un Spirille dans le sang périphérique d'un Macacus rhesus. [**Presence of a spirillum in the peripheral blood of a rhesus monkey**].—*Ann. Soc. belge Méd. trop.* **22.** 209–212. **41**

The detection is recorded of a spirillum resembling *Spirillum minus* in a smear of the blood of a rhesus monkey. It is pointed out that in the use of these monkeys as experimental animals, a naturally occurring spirillum may complicate the results obtained. —U. F. RICHARDSON.

See also abstr. **178** (*Trypanosoma equiperdum*), **236** (toxoplasmosis in pigeons), **226** (bovine piroplasmosis in Sweden).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

*MORIYAMA, H., & OHASHI, S. (1941). "Infektion" bei der Proteindenaturierung und ihre Beziehung zur Virusvermehrung. [**"Infection" during the denaturation of proteins and its connexion with the multiplication of viruses**].—*Z. ImmunForsch.* **99.** 419. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 205]. **42**

Inactivation of bacteriophage or rennin by antisera, tannic acid, or heat appears to liberate acid groups which in their turn affect intact molecules and hasten their denaturation. The suggestion advanced is that once initiated, such reactions proceed by a type of "catalysis". These phenomena are compared with those of virus multiplication. The primary denatured molecules are considered to act as "denaturases" affecting the normal cellular proteins. [The French abstractor comments on the fact that the suggestions in relation to virus multiplication are completely hypothetical.]
—J. Lochiel McGirr.

*Levaditi, C., & Bonet-Maury. (1942). Les ultravirus considérés à travers le microscope électronique. **[The study of viruses by means of the electron microscope]**.—*Pr. méd.* Feb. 24th. 203. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 206]. **43**

In this general review is discussed recent information acquired by means of the electron microscope. The principles of the instrument and the techniques required in using it are reviewed and there is discussion of information (confirming that previously obtained by indirect methods) regarding the morphology of the viruses of vaccinia, ectromelia, rabbit myxoma, and foot and mouth disease, and of tobacco mosaic virus and bacteriophage. Electron micrographs are said to have the appearance of confirming the bacteriophage theory of d'Herelle and to hold out hopes of giving "visual" information regarding the mechanism of antigen-antibody precipitation reactions.—J. Lochiel McGirr.

*Ghisleni, P. (1942). In tema di trasmissibilità di afta epizootica. Relazione di perizia extragiudiziale. **[The transmission of foot and mouth disease]**.—*Nuovo Ercol.* **47.** 221–226. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 151]. **44**

Three cows, supplied by a dealer to a farm in a district in which foot-and-mouth disease was prevalent, developed F. & M. disease about three days later. The farmer attempted to obtain compensation from the dealer; this was disallowed as it was pointed out that the incubation period of F. & M. disease can be as short as 24 hours.—W. M. Henderson.

—. (1944). Deutsches Reich. Runderlass des Reichsministers des Innern, betr. Bekämpfung der Maul- und Klauenseuche durch Schutzimpfung. **[Germany: circular concerning control of foot and mouth disease by inoculation]**.—*Reichsgesundheitsblatt.* **19.** 43–44. **45**

Vesicle epithelium from each primary outbreak is sent to the Foot and Mouth Disease Institute on the island of Riems for type determination by means of Traub's complement-fixation test [*V. B.* **14.** 231], the results of the test being obtained within 24–48 hours of the material's being received. A type-specific vaccine can then be supplied within three weeks; during this time a bivalent vaccine is employed obtainable from six regional stores as well as from the island of Riems.—W. M. Henderson.

*Zottner, G. (1942). Essai de vaccination antiaphteuse. **[Vaccination against foot and mouth disease]**.—*Bull. Acad. vét. Fr.* **15.** 172–176. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 127]. **46**

During an outbreak of F. & M. disease in Morocco in 1941, a monovalent vaccine was produced according to the method described by Cordier. The dose used was 10–15 ml. for cattle and swine and 5 ml. for young pigs. On three farms, the majority of the vaccinated cattle remained healthy while all unvaccinated cattle developed the disease.

[No clear indication is given in the abstract of the method of preparation of the vaccine; from the context it could be assumed that it was Cordier's bone-charcoal adsorbed vaccine (see *V. B.* **11.** 515.) inactivated by the addition of formalin.]—W. M. Henderson.

*Hobohm, K. O., & Pyl, G. (1943). Über den Zusammenhang zwischen Sekundärstruktur eines Aluminiumhydroxyds and Immunisierungsvermögen eines daran adsorbierten Antigens. **[Relation between secondary structure of aluminium hydroxide and the immunizing power of adsorbed antigen]**.—*Kolloidzschr.* **102.** 66–69. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 126]. **47**

The potency of aluminium hydroxide foot and mouth disease vaccine is greatly reduced by freezing. Mechanical treatment in a colloid mill restores to a large extent its original immunizing capacity. Examination by methods of colloid chemistry and X-ray crystallography shows that the immunizing properties of the vaccine are related to the secondary structure of the aluminium hydroxide and its power of absorbing the virus. The view is expressed that this explains the inactivation of the vaccine by freezing as the compression of the $Al(OH)_3$ particles makes the adherent antigen inaccessible. Mechanical grinding then releases the compressed particles and again renders the antigen effective. The addition of glycerin reduces the sensitiveness of the vaccine to cold. Besides reducing the freezing point of the vaccine, the glycerin has a non-specific protective effect for the $Al(OH)_3$. Vaccine containing 20% glycerin endures a temperature of −80°C. without significant biological or physical modification.
—W. M. Henderson.

Remlinger, P., & Bailly, J. (1940). La souris peut-elle remplacer le lapin dans l'étude expérimentale de la rage? (Premier mémoire). **[Possibility of replacing rabbits by mice in experimental research on rabies. I]**.—*Arch. Inst. Pasteur Algér.* **18.** 366–373. **48**

Although the grey mouse (*Mus musculus*) is more susceptible than the rabbit to rabies virus, there are several disadvantages which make its use in rabies diagnosis inadvisable.

In general, a mouse inoculated with "street" virus contracts furious rabies, while fixed virus provokes paralytic rabies, but there are exceptions, and clinical symptoms vary widely. The period of illness is very short and may be missed, in which case, it will be necessary to look for Negri bodies—a procedure which prolongs the time taken for diagnosis. In addition, there is the danger to attendants, who may be bitten by affected animals.

The mouse, being small, putrefies rapidly, and the brain quickly becomes useless for sectioning. Owing to its size, too, the mouse is unsuitable for urine analysis and for the examination of serum for viricidal properties.—Isobel W. Brocklehurst.

Greval, S. D. S., & Nicholas, M. J. (1940). **Rabies in lowlier animals.**—*Indian med. Gaz.* **75.** 739–740. **49**

Rabies in the spermophile or suslik (*Citellus citillus*), hedgehog, bat, mongoose, and turtle has been reported. The authors report a case of suspected rabies in a tortoise; the animal behaved in an unusual manner by biting a man bathing in a river. The theory is advanced that rabies "smoulders" in forests and flares up in human habitations, the "smouldering" occurring in wild carnivores in which it is not always fatal.—D. A. Munro (India).

*Pagot, J. (1942). La variole du porc. Etude des lésions. Essais de vaccination. **[Porcine variola]**.—*Rec. Méd. vét.* **118.** 169–175. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 126]. **50**

Yearly outbreaks of porcine variola, usually of a benign nature, were observed on a pig farm. During one month in the autumn of 1942, 20 young pigs aged two months developed generalized variola resulting in severe illness and, in some cases, death. Vaccination using equal parts of 1% phenol-glycerin and virulent porcine variola material stored for 24 hours at 2°C. is said to have produced a good degree of protection. The use of bovine vaccinia lymph for vaccination of pigs did not afford sufficient protection against the porcine variola virus.—W. M. HENDERSON.

HOYLE, L. (1944). **A report on the aetiology of the recent influenza epidemic.**—*Mon. Bull. emerg. publ. Hlth Lab. Serv., Lond.* **3.** 58–61. **51**

During the recent human influenza epidemic in the United Kingdom, an attempt was made to isolate viruses from sputum by the egg inoculation technique, but only one strain was obtained from seven samples. It was identified as an A virus but was not adaptable to mice.

Normal serum samples (209) taken in 1942, prior to the outbreak under study, were compared with convalescent samples (14) by the complement-fixation test: the latter gave much higher titres with A virus than the normal samples, whereas with B virus there was no rise in fixing antibodies. Further tests carried out at the end of the epidemic on random samples of human sera showed that doubtful or negative readings were reduced from 54% to 31%. The proportion giving low-titre reactions was increased from 45·5% to 55% and those giving high titres from 0·5% to 14%. These figures suggest that about 25% of the population had reacted to A virus.—R. E. GLOVER.

ANDREWES, C. H., & GLOVER, R. E. (1944). **The influenza "A" outbreak of October-December, 1943.** —*Lancet.* **247.** 104–105. **52**

In contrast to findings in previous years, garglings from outbreaks of human influenza during the winter period of 1943 readily produced definite symptoms in ferrets and the viruses isolated were easily transmitted in series: 58% of the samples were positive. Most of the strains, however, were not adaptable to mice in spite of repeated "blind" passage of mouse-lung material. The two strains which were obtained were of low pathogenicity and were related more closely to "Tal." and "Chr." than to other strains in the influenza A group. Attempts to adapt these viruses to developing chick embryos were unsuccessful, except in one instance. Serological evidence from recovered patients confirmed the existence of influenza A in at least 72% of the cases.

Two further strains which were readily transmissible to mice were obtained, but both behaved like mouse-adapted PR8 virus. The possibility of accidental contamination is discussed.

MAGILL, T. P., & SUGG, J. Y. (1944). **The significance of antigenic differences among strains of the "A group" of influenza viruses.**—*J. exp. Med.* **80.** 1–7. **53**

Seven different strains of influenza A virus were checked against sera from 40 influenzal patients, the mouse protection test being used. The data showed differences of sufficient magnitude to warrant their being taken into account when mass immunization and other problems of influenza in man are considered. From the practical standpoint, it was noted that the production of protective antibodies resulting from infection was not always revealed by certain strains, but could be detected by others which were closely related antigenically.—R. E. GLOVER.

ZIEGLER, J. E., Jr., & HORSFALL, F. L., Jr. (1944). **Interference between the influenza viruses. I. The effect of active virus upon the multiplication of influenza viruses in the chick embryo.**—*J. exp. Med.* **79.** 361–377. **54**

ZIEGLER, J. E., Jr., LAVIN, G. I., & HORSFALL, F. L., Jr. (1944). **Interference between the influenza viruses. II. The effect of virus rendered non-infective by ultraviolet radiation upon the multiplication of influenza viruses in the chick embryo.**—*Ibid.* 379–400. **55**

I. Observations were made on the effects of the primary inoculation of the egg with influenza A, influenza B, and swine influenza viruses respectively on the multiplication of either of the other two viruses introduced at various periods after the first.

In general, allantoic fluid inoculated initially with PR8 (A) and 24 hours later with Lee (B) contained A but not B virus and *vice versa*, although these two viruses are antigenically distinct. Similar results were obtained with swine influenza virus (Shope). The presence of the virus was determined by the inhibition of red blood cell agglutinins by specific immune sera. The interference induced by the first virus was produced by relatively small amounts, provided that the dose of the second virus was not excessive. In this respect, resistance to infection with B virus induced by A was more complete than was the case when the order of inoculation was reversed. The time factor was important, however, since during the first four hours after inoculation the initial virus was unable to prevent the establishment of the second. Complete inhibition was produced by the 12th hour. On the other hand, there was a reversal in the direction of interference if a large second dose followed a small primary dose.

II. The experiments described in I were repeated, the virus used containing allantoic fluid exposed to ultra-violet irradiation which progressively inactivates the virus. The result indicated that preparations irradiated sufficiently to destroy their capacity for multiplication in the egg or of producing infection in mice, interfered with the development of living virus even when the latter was given immediately after the inactive preparation. Prolonged irradiation, however, destroyed the interfering capacity.

Interference occurred not only when active and inactive viruses were mixed and inoculated together, but also when non-infective preparations were given after active infection had been established, provided that the dose of the inert virus was large. The time interval necessary to produce these effects varied with the different strains. Virus suspensions inactivated by heat failed to retain their capacity to produce interference.—R. E. GLOVER.

MCLEAN, I. W., Jr., BEARD, D., TAYLOR, A. R., SHARP, D. G., BEARD, J. W., FELLER, A. E., & DINGLE, J. H. (1944). **Influence of temperature of incubation on the increase of influenzal virus B (Lee strain) in the chorio-allantoic fluid of chick embryos.**—*J. Immunol.* **48.** 305–316. **56**

Influenza B virus in the form of infective allantoic fluid was inoculated into groups of eggs. The rate of increase and the total amount of virus were estimated for various periods of time after inoculation at temperatures of 35°C., 37°C. and 39°C. respectively. The chick cell agglutination test and the endpoint in infectivity of allantoic fluid were used throughout to determine the titre of the virus.

A temperature of 39°C. was less favourable than the two lower ranges. Infectivity after 24 hours' incubation was essentially the same at 35°C. and 37°C.;

thereafter, there was a more marked increase at 35°C., infectivity at 48 hours being about six times that attained at 37°C. Haemagglutination activity was also greater at 35°C. than at 37°C.—R. E. GLOVER.

I. KUBES, V. (1944). **Venezuelan type of equine encephalomyelitis virus in Trinidad.**—*Amer. J. vet. Res.* **5.** 30–31. [Also appeared in *Science.* **99.** 41–42. (1944)]. **57**

II. GILYARD, R. T. (1944). **Mosquito transmission of Venezuelan virus equine encephalomyelitis in Trinidad.**—*Bull. U.S. Army med. Dep.* No. 75. pp. 96–107. **58**

III. RANDALL, R., & MILLS, J. W. (1944). **Fatal encephalitis in man due to the Venezuelan virus of equine encephalomyelitis in Trinidad.**—*Science.* **99.** 225–226. **59**

I. A neurotropic virus isolated from the brain of a horse and of a mule in Trinidad appeared to be identical with the Venezuelan type of E.E. virus. The method of isolating the virus and establishing its immunological identity with that of the Venezuelan type is described.

II. G. describes an outbreak of Venezuelan E.E. in Trinidad, in which he succeeded in demonstrating the virus in mosquitoes. He considers that *Aëdes taeniorhynchus* may have been responsible for the original introduction of the infection, as this species has been shown to be capable of crossing the six miles of water which separates Trinidad from Venezuela, in contrast to other local marsh-breeding mosquitoes, whose flight range is restricted largely to their breeding areas. The *Mansonia titillans* complex was probably the chief vector in the epizootic described.

III. This is the first recorded case of the Venezuelan strain of E.E. causing death in man. The virus was isolated from brain tissue and its identity established by comprehensive immunological tests.—G. B. S. H.

CASALS, J. (1944). **Immunological relationships among central nervous system viruses.**—*J. exp. Med.* **79.** 341–359. **60**

Complement-fixation, serum-neutralization, and cross-resistance tests were carried out to determine the relationship between the viruses of Russian encephalitis, louping-ill, St Louis encephalitis, Japanese B encephalitis, and Western equine encephalomyelitis. The results indicated the presence of antigenic constituents common to certain of these viruses with considerable variations in the amounts. Russian encephalitis and louping-ill formed one group showing a close relationship by all three tests. St. Louis and Japanese B viruses formed a second group in which there was a less close degree of group relationship, whilst Western E.E. was quite distinct from the rest.

Following vaccination, complement-fixation antibodies were well developed by the tenth day, whereas neutralizing antibodies appeared much later. For this reason, multiple observations embracing all available methods of detecting antibodies are recommended when an attempt is made to differentiate closely related viruses.—R. E. GLOVER.

I. EVANS, C. A., YANAMURA, H. Y., & GREEN, R. G. (1943). **A sensitive test for fox encephalitis virus.**—*Proc. Soc. exp. Biol., N.Y.* **53.** 183–186. **61**

II. GREEN, R. G., EVANS, C. A., & YANAMURA, H. Y. (1943). **Susceptibility of the raccoon to fox encephalitis.**—*Ibid.* 186–187. **62**

I. In a search for a reliable test for the presence of fox encephalitis virus, an examination was made for the presence of inclusion bodies in the tissues of foxes at the site of subcutaneous and intramuscular inoculation of the virus, in the lymph nodes draining those regions, and in the cells of eye tissue following intra-ocular injection.

Examination of the lymph nodes provided a ready means of detecting the presence of the virus, but this method was not studied further as the results of intra-ocular injection were found to be more satisfactory. About 0·5 ml. of aqueous humour was removed, under ether anaesthesia and an equal amount of virus suspension injected into the eye. Eyes were removed from inoculated foxes at intervals of 24 hours up to four days and inclusion bodies were demonstrated in every case. Smears for this purpose were obtained from scrapings taken from the inner surface of the cornea.

II. In five raccoons which had received intra-ocular injections of fox encephalitis virus, inclusion bodies were present in the cornea. One animal developed typical symptoms of the disease and virus was demonstrated in the spleen. Thirty-six days later, two of the animals were given a second intra-ocular injection consisting of 10 minimal infective doses for the eye of the fox; this time no inclusion bodies could be demonstrated, thus indicating the development of an immunity.—J. C. BUXTON.

*HOFSTAD, M. S. (1944). **A study of infectious bronchitis in chickens.**—*Thesis, Cornell.* pp. 82. **63**

Infectious bronchitis is rather common and the most common respiratory disease of chicks in New York State.

The main emphasis of the investigation lies in the microscopic pathology, diagnosis, and immunity. Microscopic changes in the experimental birds consist of a serous or catarrhal tracheitis and bronchitis. Although not pathognomonic of the disease, these changes are of some value in diagnosis. The chicken red cell agglutination test was not useful as a diagnostic procedure. For diagnosis, it is desirable to inoculate susceptible chicks intratracheally with filtered and unfiltered tracheal extract diluted with physiological saline solution. The information obtained, together with the flock history, symptoms, and lesions should suffice.

Solid immunity results from infection, within a few days after recovery and at least up to seven months afterwards.

Five trials failed to produce evidence that carriers occur among recovered birds.

—H. L. GILMAN (U.S.A.).

LORENZ, F. W., & NEWLON, W. E. (1944). **Influence of avian pneumoencephalitis on subsequent egg quality.**—*Poult. Sci.* **23.** 193–198. **64**

Field reports had stated that following outbreaks of avian pneumo-encephalitis, abnormalities were occurring in freshly laid eggs. Two studies were carried out in order to investigate the influence of this disease on eggs subsequently produced by recovered birds.

In the first study, 4,000 eggs were examined from birds on three ranches, where outbreaks of avian pneumo-encephalitis had occurred, the birds first having shown symptoms 7–36 days previously. 4% of these eggs were found to contain an accumulation of small free-floating air bubbles instead of a true air cell. In individual groups of birds, from 0 to 10% produced this abnormality in their eggs. 12% of these bubbly eggs had cracked shells and the average shell quality in all eggs was poor. The incidence of bubbles in the eggs bore no direct relation to the severity of the disease.

In the second study, eggs were acquired from 100 trap-nested pullets in a flock in immediate danger of infection owing to disease in neighbouring flocks. Several days' egg production was examined before symptoms of the disease were observed and then all eggs produced by these birds were candled for 45 days

after the beginning of the epidemic. On two consecutive days in each week, eggs were broken for albumen height measurement. 6·4% of the eggs laid during the observation period were bubbly. 80% of all bubbly eggs were laid by eight birds, another 12 birds laying the remainder. Thus only 21·7% of the flock produced this abnormality. A considerable number of eggs with abnormal shells was produced, but this defect was more evenly distributed than that of bubbly eggs and no bird laid more than four eggs of this type throughout the period. Measurements of albumen height were obtained on 178 eggs from 64 birds. With one exception, the average albumen height of eggs from each of these birds was lower after the disease than before.

The cause of egg changes following an outbreak of pneumo-encephalitis was not determined.—J. D. B.

*Molina, L. (1942). Ricerche sull'agente eziologico dell'attuale epizoozia dei polli. L'infezione sperimentale negli embrioni di pollo. **[The cause of the current epizootic in fowls in Italy].**—*Boll. Ist. sieroter. Milano.* **21.** 379–385. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **141.** 357]. **65**

Investigating a virus isolated from a severe disease of fowls in Italy in 1940, by cultivation in the embryo chick, M. concludes that the disease more closely resembled Newcastle disease than it did fowl plague or laryngotracheitis.—U. F. Richardson.

Topping, N. H., Heilig, R., & Naidu, V. R. (1943). **A note on the rickettsioses in India.**—*Publ. Hlth Rep., Wash.* **58.** 1208–1210. **66**

The rickettsiases in India cannot with available knowledge be clearly differentiated. Endemic (murine) typhus apparently exists, as strains that produce OX19 agglutinins have been isolated from wild rats. A small outbreak probably of epidemic (louse-borne) typhus in human beings has been reported. It is suspected that cases of the mite-borne type may occur in India. Also there are cases which cannot be classified readily either by the Weil-Felix test or by clinical or epidemiological considerations. One case is on record in which the suspected vector was a tick. Sera from three recent cases, tested by the complement-fixation method, gave results indicating that the causative agent was closely related immunologically to the rickettsia of Rocky Mountain spotted fever.—U. F. Richardson.

Sikora, H. (1942). Zur Morphologie der Rickettsien. **[The morphology of rickettsia].**—*Z. Hyg. InfektKr.* **124.** 250–270. **67**

Rickettsia occurring in insects are described as consisting essentially of cocci which may be round or oval and which consist of chromatoid material only. In the process of multiplication, these cocci lengthen and develop into bipolar bodies, the poles staining red with Giemsa and the centre blue. There may be division at this stage, but usually a third chromatin granule develops in the centre of the rod which continues to lengthen. Division then occurs through the central granule, two bipolar rods being formed. The central part of the rod becomes constricted to produce the dumb-bell form which finally divides to form two granules. It is claimed that the process of division in *Pasteurella aviseptica* is almost exactly similar.

It is also claimed that species of rickettsia can be differentiated on morphology alone, as in each species there is a characteristic predominance of one stage of the multiplication forms. Thus in *R. melophagi* cocci predominate and in *R. prowazeki* dumb-bell forms are exceptionally numerous. *R. pediculi* var. *polon* is characterized by the predominance of bipolar forms, and by the tendency to form chains.

It is suggested that the additional forms described by other authors are due to mixed infections or misinterpretation of Giemsa staining, and the homogeneous inclusion bodies described in infected mammals are ascribed to concurrent infection with a virus.

It is claimed that rickettsia should be classified as bacteria, and that, as they will grow in cell-free cultures and are capable of passing from one vertebrate to another without passage through an intermediate host, they can no longer be defined as intracellular organisms transmitted by insect vectors. It is therefore suggested that rickettsia should be defined as micro-organisms which persist essentially as granules, and only develop to rods (cells) during the process of multiplication.

[S. does not give full consideration to the findings of other workers, and his views may not be generally accepted.]—U. F. Richardson.

Hershey, A. D., Kalmanson, G. M., & Bronfenbrenner, J. (1944). **Coordinate effects of electrolyte and antibody on the infectivity of bacteriophage.**—*J. Immunol.* **48.** 221–239. **68**

Experiments are reported on the diverse effects of salt and antibody on the infectivity of two colon-dysentery phages. With regard to electrolytes, it was found that univalent cations favoured infectivity but not to an equal degree, whereas divalent cations (Ca or Mg) depressed activity in the absence of Na. The variations in salt-free medium were traced to the effect of pH changes on the concentrates of Ca ions. Lithium in suitable concentrations increased the size of the plaques.

Phage particles exposed to antiserum retained their infectivity, but differed from native phage by showing an increased rate of absorption. This effect can be explained if it is assumed that more than one antibody molecule is required to neutralize a single particle of phage.

Various hypotheses arise from these findings, for which those interested should consult the original.

—R. E. Glover.

See also absts. **187** (F. & M. disease), **225** (rabies in cattle in Brazil), **226** (E.I.A. and S.F. in Sweden), **110** (virus disease of foals), **37** (virus in East Coast fever), **235** (S.F. in St. Lucia), **180** (dog distemper), **181** (avian leucosis), **112** (trachoma), **209** (rickettsia), **239** (text-book).

IMMUNITY

I. Winter, L. B. (1944). **Anaphylaxis to serum proteins in the guinea-pig.**—*J. Physiol.* **102.** 373–405. **69**

II. Winter, L. B. (1944). **Absorption of serum proteins from the intestine of the sensitized guinea-pig.**—*Ibid.* 484–490. **70**

I. The antigenic characteristics of serum proteins and the question of whether or not such proteins are absorbed from the intestine were subjected to detailed investigation, techniques used being based on the development of anaphylactic sensitization and desensitization in female g. pigs. Horse serum, purified globulin, and re-crystallized albumin derived from such serum, and "synthetic serum" prepared by mixing equal quantities of the albumin and globulin in normal saline were used as sensitizing and test antigens; the reaction of the isolated uterus was the criterion of desensitization. 797 g. pigs were used in the tests performed.

The results obtained indicated (a) that albumin

and globulin, or proteins antigenically indistinguishable from them, were absorbed in significant amounts within a few hours of their introduction into the small intestine—W. remarks that such absorption is probably not limited to the artificial conditions obtaining in this study and that it may occur normally if protein escapes the action of the proteolytic enzymes of the upper alimentary tract, (b) that the liver probably played an important part in the acute anaphylactic reaction in the g. pig, and (c) that albumin and globulin probably did not exist as separate entities in blood serum and that the apparent " albumin-globulin complex " which did exist was variable in composition.

This article, which contains much useful information, should be consulted in the original by those interested in this field.

II. Further experiments on the absorption of horse serum from the intestine of the sensitized g. pig indicated that an initial small amount might pass through the intestine because of distension of the gut, that this fraction produced desensitization, and that the bulk of the serum was not absorbed. On the other hand, results with albumin and globulin, in which the volumes injected into the duodenum did not exceed 1 ml. indicated that appreciable amounts of these proteins passed from the intestinal lumen to the bloodstream within 15–30 min. and that intestinal distension was not involved in this process.—J. Lochiel McGirr.

Maignon, F. (1943). Une nouvelle méthode générale de traitement des maladies microbiennes, déduite de la théorie fermentaire de l'anaphylaxie et de l'immunité. **[Treatment of microbial disease based on the ferment theory of anaphylaxis and immunity].**—*Bull. Acad. vét. Fr.* **16.** 167–176. **71**

The ferment theory of anaphylaxis is explained as follows. When foreign protein is injected into the animal body, it is broken up into polypeptides and peptones by a primary specific enzyme. These products or their derivatives are toxic, but a secondary non-specific ferment breaks them down to the amino-acid stage and renders them non-toxic. The secondary ferment disappears in 6–8 days, but the primary ferment persists in the blood and its presence there determines the state of sensitization.. If an assaulting dose of the protein is now given, it is immediately broken down to the toxic stage by the primary ferment, and as there is not enough of the secondary ferment to deal with the toxic substances, anaphylactic shock takes place.

By analogy, M. believes that the toxin of the tubercle bacillus is a primary stage in the disintegration of constituents of the bacterial cell, and that it can be rendered harmless by treating the tuberculous patient with doses of the secondary enzyme.

M. suggests that tetanus, diphtheria, typhoid, and other microbial diseases could be dealt with in the same way.—Isobel W. Brocklehurst.

*Mutsaars, W., & Alexander, Y. (1941). La teneur en quatrième composante du sérum frais de cheval. **[The fourth component of fresh horse serum].**—*Acta biol. belg.* **1.** 358. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 219]. **72**

Investigations of the nature of the complement present in fresh horse serum indicate that it is deficient not only in the third but also in the fourth component. —J. Lochiel McGirr.

*Bevere, L. (1942). Aspetti dell'agglutinazione brucellare nel liquor. **[Agglutination of brucella].**—*Boll. Sez. ital. Soc. int. Microbiol.* **14.** 105–106. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 346]. **73**

The agglutination of brucella is said to occur in two phases, that of granular agglutination caused by O antigens, and that of floccular agglutination caused by H antigens.—U. F. Richardson.

Mørch, E., & Knipschildt, H. E. (1944). **Serological relationship between a strain of Bac. coli and some pneumococcus types.**—*Acta path. microbiol. scand.* **21.** 102–109. [In English]. [Authors' summary copied *verbatim*]. **74**

Serological relationship is demonstrated between a colon strain and pneumococci of the Type 9 group and Type 27. Immune serum produced with this colon strain gives capsular swelling and agglutination with the pneumococcus types mentioned.

Mørch, E. (1944). **Serological relationship between a streptococcus strain and some pneumococcus types.**—*Acta path. microbiol. scand.* **21.** 96–101. [In English]. [Author's summary copied *verbatim*]. **75**

The existence of antigens common to a non-haemolytic streptococcus and to pneumococcus Types 19A, 19B, 19C and 40 is demonstrated. Immune serum produced with this streptococcus strain gives capsular swelling with pneumococcus Type 19C.

Schmidt, S. (1943). Formolvacciner. **[The effect of formaldehyde on proteins, bacteria, toxins, and viruses].**—*Maanedsskr. Dyrlaeger.* **55.** 355–368, 369–384 & 385–392. **76**

This is a review on the use of formaldehyde in immunobiology. The chemical characters of formaldehyde and its reactions with relevant organic chemical compounds are illustrated, and the immunological effects of adding formalin to bacteria, toxins, and filtrable viruses are reviewed.

Bacterial formol vaccines have not come into general use, although some success has been claimed for Shiga dysentery formol vaccine.

The treatment of bacterial toxins with formalin has been very successful in the production of potent and harmless immunizing agents, particularly against diphtheria and tetanus.

Formalin-treated virus vaccines have been much used against equine encephalomyelitis, rinderpest, African horse sickness and foot and mouth disease and with less uniformly good results against dog distemper, fowl plague, influenza, cow pox and swine fever.—J. E.

Sordelli, A., Sanchez, S., Franzani, O., Ferrari, J. P., & Gvirtzman, I. (1943). Vacunación asociada. **[Immunization with associated vaccines].**—*Rev. Inst. bact., B. Aires.* **12.** 103–119. **77**

With a vaccine for human beings consisting of diphtheria and tetanus toxoids, together with heat-killed typhoid bacilli, the reaction to vaccination is small and antibody formation is good. This compound vaccine can be used in conjunction with pneumococcal vaccine prepared from types 1, 2 and 3.

—Isobel W. Brocklehurst.

Scheibel, I. F. (1944). **Experimental studies on active immunization with combined diphtheria-tetanus vaccine.**—*Acta. path. microbiol. scand.* **21.** 130–141. [In English]. [Author's summary copied *verbatim*]. **78**

Immunization with combined diphtheria-tetanus vaccine results in lowered antibody production for one of the antigens.

Gottschall, R. Y., Mitchell, A. B., & Stringer, C. J. (1944). **The cutaneous activity of old tuberculins prepared by the same and by different methods.**—*Amer. Rev. Tuberc.* **50.** 68–80. [Spanish summary]. **79**

In a study designed to investigate whether the g. pig can be relied upon as a test animal for titrating

tuberculins prepared for human use, six different heat-concentrated preparations made from various synthetic medium cultures of human strain " Dt " were tested on human beings and on sensitized g. pigs. The results obtained indicated that titres determined on human subjects might differ considerably from those derived from g. pig experiments ; such deviations were particularly evident in tuberculins prepared by different methods. Because of animal to animal variations in the size of the reactions produced by different tuberculins, it is held that the serial dilution method of titration is not satisfactory for potency determinations on tuberculins prepared by different methods. On the other hand, a statistical analysis of the results of the investigation suggests that the potency of tuberculins prepared in a similar manner is determined more reliably in g. pigs than in human subjects.—J. Lochiel McGirr.

Corper, H. J., & Cohn, M. L. (1944). **Further observations on the production of autolytic tuberculin.**—*Amer. Rev. Tuberc.* **50.** 81–84. [Spanish summary]. **80**

Results were obtained in this study indicating that volatile reagents such as diethyl ether and petroleum ether can be used for the production of autolytic tuberculin [see also *V. B.* **14.** 195, abst. 1256.] provided that the reagent-buffer-organism system is enclosed in sealed glass tubes.—J. Lochiel McGirr.

*Lettré, H., & Haas, R. (1940). Ueber chemisch markierte Antigene. I. Eine neue Methode zur Darstellung chemisch markierter Antigene. **[Chemically marked antigens. I. A new method].**—*Hoppe-Seyl. Z.* **266.** 31–36. **81**

*Lettré, H., & Fernholz, M. E. (1940). II. Zur Reaktionsfähigkeit von Oxazolonen. **[Chemically marked antigens. II. The reactivity of oxazolones].**—*Ibid.* 37–40. **82**

*Lettré, H., Buchholtz, K., & Fernholz, M. E. (1940). III. Zur Einführung von vierkernigen Ringsystemen in Proteine. **[Chemically marked antigens. III. The introduction of four-ring systems into proteins].**—*Ibid.* **267.** 108–114. **83**

[Absts. from absts. in *Bull. Inst. Pasteur.* **41.** 195].

I–III. The use of oxazolones for the introduction of new groupings into protein molecules is suggested. These reagents, obtained by heating benzoyl acid amines with acetic anhydride, react with NH_2 (but probably not NH), phenolic OH (tyrosine), alcoholic OH (serine), and SH groups, and possibly with the guanidine group of arginine. Proteins substituted with oxazolones lose their amphoteric character, are insoluble in acid media but often dissolve in mildly alkaline solutions. Preliminary experiments, using the Dale technique, indicate that specificity modifications are produced by oxazolone treatment.

In view of research on the antigenic activity of carcinogens, the authors attempted to use their method to couple pyrene derivatives with proteins. They first prepared an oxazolone from which they obtained pyrene-3-carbonic acid. This substance coupled with alanine and then heated with acetic anhydride gave an oxazolone which reacted with proteins in dioxan solution.—J. Lochiel McGirr.

I. Lanfranchi, F. (1942). Ricerche comparative del potere immunizzante degli antigeni microbici associati, nei confronti degli antigeni glucido-lipidici associati, degli stessi germi. **[Research on immunizing power of associated microbial antigens, compared with associated glyco-lipoid antigens of the same organism].**—*Boll. Soc. ital. Biol. sper.* **17.** 166–167. **84**

II. Lanfranchi, F. (1942). Ricerche comparative circa l'azione adiuvante—nello stabilirsi dell'immunità—del *subtilis*, se associato al *septicus* o al paratifo, e del polisaccaride di esso, se associato agli antigeni glucido-lipidici dei germi sopra detti. **[Research on the adjuvant action (for strengthening of immunity) of *Bacillus subtilis* in association with *Pasteurella septica* and salmonella and its polysaccharide in association with glyco-lipoid antigens of the same organisms].**—*Ibid.* 169–170. **85**

III. Lanfranchi, F. (1942). Ricerche comparative del potere immunizzante degli antigeni microbici associati fra loro e a un germe adiuvante non patogeno, nei confronti dei rispettivi antigeni glucido-lipidici associati anche al polisaccaride del germe sopra detto. **[Research on the immunizing power of associated microbial antigens and of adjuvant non-pathogenic organisms in comparison with glyco-lipoid and polysaccharide associated antigens of the same organism].**—*Ibid.* 171–172. **86**

I. Groups of mice were immunized simultaneously against *S. typhi-murium* and against *Pasteurella septica* ; one group was immunized with suspensions of the bacteria and another with glyco-lipoid extracts. Immunity tests were then made by inoculation with strains of each organism. The mice immunized with bacterial suspensions lived longer after injection with the test doses than those given the extracts.

II. The addition of *B. subtilis* polysaccharide to the glyco-lipoids of *Past. septica* and of *S. typhi-murium* and to a suspension of *Past. septica* made little difference to their immunizing value, but the addition of a *B. subtilis* suspension to a *S. typhi-murium* bacterial vaccine gave some slight increase in immunity

III. When *B. subtilis* polysaccharide was added to the combined glyco-lipoid extracts of *Past. septica* and *S. typhi-murium*, the survival time of vaccinated mice after the test dose was only slightly increased, whereas animals immunized with mixtures of the three bacterial suspensions had a recovery rate of 50% to *S. typhi-murium* infection and of 75% to *Past. septica.*

—U. F. Richardson.

Sordelli, A., Manzullo, A., Ferrari, J., & Viola, R. N. (1943). La aplicación de varios antígenos por vía nasal. Estudio experimental. **[Intranasal inoculation of g. pigs with various antigens].**—*Rev. Inst. bact., B. Aires.* **12.** 134–139. **87**

Experiments in g. pigs show that it is possible to produce a high level of immunity to diphtheria, staphylococcal, and tetanus toxins, when the secondary stimulus is provided by intranasal inoculation of toxoid, the primary stimulus in each case being a parenteral injection of toxoid. Immunity also follows when both primary and secondary stimuli are given intranasally.

—Isobel W. Brocklehurst.

Pauling, L., Pressman, D., Campbell, D. H., Ikeda, C., & Ikawa, M. (1942). **The serological properties of simple substances. I. precipitation reactions between antibodies and substances containing two or more haptenic groups.**—*J. Amer. chem. Soc.* **64.** 2994–3003. **88**

Pauling, L., Pressman, D., Campbell, D. H., & Ikeda, C. (1942). **The serological properties of simple substances. II. The effects of changed conditions and of added haptens on precipitation reactions of polyhaptenic simple substances.**—*Ibid.* 3003–3009. **89**

Pauling, L., Pressman, D., & Ikeda, C. (1942). **The serological properties of simple substances. III. The composition of precipitates of antibodies and polyhaptenic simple substances ; the valence of antibodies.**—*Ibid.* 3010–3014. **90**

PRESSMAN, D., BROWN, D. H., & PAULING, L. (1942). **The serological properties of simple substances. IV. Hapten inhibition of precipitation of antibodies and polyhaptenic simple substances.**—*Ibid.* 3015–3020. **91**

PRESSMAN, D., MAYNARD, J. T., GROSSBERG, A. L., & PAULING, L. (1943). **The serological properties of simple substances. V. The precipitation of polyhaptenic simple substances and antiserum homologous to the *p*-(*p*-azophenylazo)-phenylarsonic acid group and its inhibition by haptens.**—*Ibid.* 65. 728–732. **92**

I. Twenty simple antigens containing two or more haptenic groups per molecule, and seven containing only one haptenic group per molecule, were subjected to precipitin tests with hapten-homologous antisera made by injecting rabbits with azo-phenylarsonic-acid-sheep-serum. The polyhaptenic antigens gave precipitates with the antisera, the monohaptenic antigens did not. This result is held to provide strong support for the Marrack-Heidelberger framework theory (lattice hypothesis) of precipitation, since the multivalent antibodies postulated by the theory would be expected to combine with polyhaptenic molecules to form infinite aggregations which would grow into visible precipitates, whereas the monohaptenic molecules would form small soluble complexes containing only one antibody molecule. Data on the amounts of the precipitates formed are also discussed in relation to the structure of the simple antigens.

II. The relationship was investigated of time and temperature of precipitation, washing, addition of buffer solution and of normal serum, pH, and addition of hapten to the amount of the precipitate formed by the interaction of antisera and simple polyhaptenic antigens. The results were as follows:—precipitate increased by 10% by increasing the duration of precipitation from 1–2 days; the effect of temperature inconclusive; amount of precipitate decreased by the addition of borate buffer; optimum zone shifted by dilution of antiserum in such a way as to keep the ratio of antibody to antigen constant in the precipitate; precipitate formed by the interaction of polyhaptenic substance and hapten homologous antiserum decreased by the addition of one of the antigen haptens. An explanation of these results (and those of part I) in terms of the multivalent-antibody theory is formulated and presented in the form of a simplified model susceptible to mathematical treatment.

III. The results of nearly 400 analyses of precipitates formed by the interaction of dyes containing azophenylarsonic groups in the hapten-homologous antisera are presented and discussed. The average antigen-antibody ratio was 0·75 for dihaptenic dyes, 0·85 for trihaptenic dyes, and 0·83 for tetrahaptenic dyes. These results are held to indicate that only two of the haptenic groups of a dye are effective in reacting with antibody (the others presumably being inhibited by the steric interference of the attached antibody molecules), while the approximation of the values to unity is taken to indicate that most of the antibody molecules are bivalent.

IV. Data are presented relating to the inhibiting action of substituted phenylarsonic acids on the precipitation of polyhaptenic simple substances (containing two or more phenylarsonic acid groups) by antisera obtained by inoculating rabbits with sheep serum coupled with diazotized-*p*-arsanilic acid. With any one serum the order of the inhibitory action of four haptens was found to be the same for each of five test antigens. The results of experiments concerning the inhibitory activity of 24 haptens on one antigen-antibody system are interpreted in terms of the bond-strength constant [*V. B.* **12.** 30.] of the hapten-antibody complexes, and the values calculated are shown to be related to the structure of the haptens.

V. Data on the precipitation reactions of polyhaptenic simple substances with antisera prepared by inoculating rabbits with azoproteins made from *p*-(*p*-azophenylazo)-phenylarsonic acid are reported. The effects of 26 haptens were studied and the results interpreted in terms of the values of the bond-strength constant [see PAULING—*V. B.* **12.** 30.] of the haptens with the antibody. The relationship of the structure of the hapten molecules to these values is discussed and comparison is made with the values previously reported [see part IV] for a rabbit antiserum to azoprotein made from *p*-arsanilic acid. The failure of some of the polyhaptenic substances to form precipitates is explained in terms of steric hindrance.—J. LOCHIEL MCGIRR.

HARTMANN, G., & FRIEDENREICH, V. (1943). **Contribution to the discussion on the presence of antigen and the corresponding antibody within the same organism.**—*Acta path. microbiol. scand.* **20.** 45–63. [In English]. **93**

Examination of the saliva of 206 cows demonstrated the presence of an A-antigen which, by combination with human iso-anti-A serum, could prevent the agglutination of group A_1 red blood corpuscles. Serum samples from the same animals were capable of agglutinating corpuscles of group A_1 after absorption with corpuscles of groups O and B. The concentration of the A-antigen in the saliva varied inversely with the amount of anti-A in the serum. The reaction of the A-antigen of a cow with the A-antibody in its own serum was studied in 76 cases, the reaction being compared at the same time with that with human iso-anti-A serum. The distribution of results showed a greater affinity of the A-antigen for the human antibody than for that in the cow's own serum, although in some cases there was no detectable difference between the two anti-A factors. The authors consider that this is evidence of the natural occurrence of an antigen and its corresponding antibody in the same organism.—W. M. H.

*GRABAR, P. (1941). Sur quelques propriétés des anti-exotoxines, des anti-endotoxines et des anti-polyosides bactériens. **[The chemistry of the antibodies to bacterial exotoxins, endotoxins, and polysaccharides].**—*Bull. Soc. Chim. biol. Paris.* **23.** 24–30. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 198]. **94**

In this review are discussed *in vitro* immunological reactions such as precipitation and flocculation, the chemical and physical properties of certain antibodies having the properties of euglobulins and of others having the properties of pseudoglobulins, the action of pepsin on various immune bodies, and electrophoretic, ultrafiltration, and ultracentrifugal data.—J. L. MCGIRR.

SELMAR, E. (1944). **On the formation of bacterial antibodies in tissue cultures. A review and an experiment.**—*Acta path. microbiol. scand.* **21.** 517–521. [In English]. [Author's summary copied *verbatim*]. **95**

After mention of some experiments that lend support to the assumption of a cellular origin of the bacterial antibodies, a survey is given of the results reported in previous experiments with tissue cultures in vitro aimed to elucidate the question about the relation of the bacterial antibodies to the cells.

Finally, a report is given of the author's own experiment with employment of cultures of heart and spleen from chicken embryos together with Bac. abortus Bang. No agglutinin formation could be demonstrated.

I. Topley, W. W. C. (1938). **The rôle of active or passive immunisation in the control of enteric infection.**—*Lancet.* **234.** 181–186. **96**

II. Gardner, A. D. (1944). **Provocation typhoid.** [**Correspondence**].—*Ibid.* **247.** 160. **97**

I. In the course of a detailed study on the general principles governing the value of immunization in controlling enteric infection, T. reviews the literature on " provocation typhoid ", *i.e.* the type of disease encountered in persons already infected and who have received vaccine. The view is expressed that the exacerbation of the symptoms in such cases is a well attested fact and that in the presence of a latent infection vaccination is a procedure which is better avoided.

II. G. challenges the conclusions drawn by Topley [see I] on the grounds that the relevant papers provide no solid evidence that the inoculation of vaccine is a danger to persons already exposed to infection. It is suggested that there is no valid basis for the conception of a " negative phase " and that the fear of provocation should not prevent widespread inoculation whenever the circumstances seem to demand it.—R. E. Glover.

See also absts. **43** (antigen-antibody reactions), **60** (immunological relations of viruses), **2** (staphylococcal toxins), **13** (tubercle polysaccharide), **11** (hypophysectomy and TB. immunity), **208** (johnin P.P.D.), **10** (diagnosis of TB.), **25, 26, 30** (of brucellosis), **5, 45-47, 50** (vaccines), **102** (serological diagnosis of neoplasms), **106** (Rous sarcoma antibody), **162** (diffusing factors), **197** (precipitating sera for identification of meat products).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

*Pavlov, P., & Miljowski, K. (1942). Untersuchungen über die Zeckenlähme in Bulgarien. [**Tick paralysis in Bulgaria**].—*Dtsch. tierärztl. Wschr.* pp. 539–542. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 354]. **98**

The Wraza district of Bulgaria is said to be the northern limit of tick paralysis, which affects sheep, goats, and calves, but not dogs or man. The transmitter is said to be *Haemaphysalis punctata*, as it is in Macedonia and Greece, but the disease occurs only in bush and forest areas and not on pastures or cultivated ground. Recovery occurs within 12–24 hours of the removal of the ticks, but a second attack may occur in 20–30 days, although this attack is usually milder. The clinical symptoms are described. No pathological changes were detected in cases examined.—U. F. Richardson.

See also abst. **237** (vectors of equine infectious anaemia).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Skryabin, K. I., & Shul'ts, R. S. (1941). Bor'ba s glavneĭshimi gel'mintozami loshadeĭ. [**The control of the principal helminths of horses**].—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses*]. pp. 145–163. **99**

The authors summarize the distribution and the importance of helminths in horses and also discuss recent developments in control of *Parascaris, Oxyuris, Dictyocaulus*, strongyle, *Onchocerca*, and *Strongyloides* infestations. They claim that the U.S.S.R. was the first country to apply simultaneous therapeutic and prophylactic measures on a large scale. The occasional " worming " of individual animals was rejected because it may stimulate dissemination of parasites, and instead systematic mass sanitation of the area and of the whole equine population was instituted, including all surroundings and outside media which are linked with the development of the parasites. Seasonal characteristics of the parasites and climatic conditions of the areas are taken into consideration. The whole complex of such measures is termed " dehelminthization ".

The States Commission for Planning of Husbandry has plans for the systematic dehelminthization of all horses in the U.S.S.R., and although the programme was only in the early stages in 1941, considerable work had already been done. Since 1936, many thousands of horses have been subjected to planned dehelminthization. There has also been a considerable increase in the number of qualified veterinary helminthologists, and an improvement in quality of anthelmintics used.

—A. Moldawsky.

Ottaway, C. W., & Bingham, M. L. (1941). **Some records of parasitic aneurysm in clinically affected horses.**—*Vet. Rec.* **53.** 275–282. Discussion pp. 295–297. **100**

The authors made a detailed *ante-* and *post-mortem* study of five ponies. A description of the bodily condition, together with the results of rectal examination for aneurysms, worm egg counts, and blood examination, is given for each animal. Three tables are given summarizing the clinical and P.M. findings and recording the positions of the aneurysms found.

Total worm counts were not made but the numbers are said to be " well above normal " in all five ponies. The following parasites were recorded in all cases :– *Strongylus edentatus, S. vulgaris, Trichonema* spp., *Triodontophorus* spp., and *Gastrophilus intestinalis* larvae. *Anoplocephala perfoliata* was found in two ponies, *Parascaris equorum* in four, and larvae of *Oxyuris equi* in one.

Extraperitoneal infestation with *S. edentatus* and *S. vulgaris* was heavy. Aneurysms found at the root of the anterior mesenteric artery varied in size from 2–4 in. × 3–5 in.

The authors state that the extreme emaciation of the ponies could only have been due to parasitic infestation. Other ponies examined were not clinically affected but small aneurysms were found. They suggest that all unthrifty horses and ponies should be examined and treated for strongylosis.

In the discussion, Male expressed the opinion that, in fatal cases, death is frequently due to an acute enteritis caused by intestinal worms, rather than to interference with the circulation or nerve supply produced by aneurysms. Oldham noted the non-occurrence of *Strongylus equinus* in the five ponies, and suggested that this species appears to be rare in Great Britain. G. H. Wooldridge thought it remarkable that so many larvae should be found in aneurysms and none in the lungs, and put forward the theory that the normal migration route is *via* the vaso vasorum and not by the lungs. Colic might be produced by embolism of the smaller arteries of the bowel wall with material from a thrombus or by obstruction of the abdominal arteries by the larvae. Ottaway replied that it seemed impossible that larvae could migrate from an aneurysm ; he believed that colic arose from pressure on the vagosympathetic nerve supply to the intestine.

No conclusion was reached as to the normal route of migration of the larvae.—H. D. Crofton.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

PELOURO, J. T. (1942). Existência em Portugal do sarcoma venéreo dos cães. (Sarcoma de Sticker). **[Venereal sarcoma of a dog in Portugal].**—*Repos. Lab. Pat. vet., Lisboa.* **5.** 83–89. [Also appeared in *Rev. Med. vet., Lisboa.* **37.** 100–106. (1942)]. **101**

This is a record of a case of infectious venereal sarcoma in a six-year-old bitch. Metastases were present in the liver and spleen.

—ISOBEL W. BROCKLEHURST.

LEHMANN-FACIUS, H. (1942). Weitere Versuche zur Methodik der serologischen Tumordiagnose durch Lipoidausflockung. **[Diagnosis of neoplasms by the lipoid flocculation method].**—*Z. ImmunForsch.* **102.** 175–186. **102**

In 1933, L. described a serological method for the diagnosis of neoplasms, the principle being a flocculation of lipoids of a tumour extract by the serum of the patient. The main difficulty is to obtain a stable emulsion of antigen and to overcome this and other difficulties, various modifications of the original method have been introduced. The most satisfactory procedure gave positive results with 70–80% of tumour sera, but 14–27% of sera from patients with TB. or syphilis also gave a positive reaction. Five of six patients with a precancerous condition gave a positive result and this suggests that the method may perhaps be of value in the early diagnosis of malignant growths.

Suitable human material for preparation of the antigen is often difficult to obtain and L. has followed Japanese workers in using extracts prepared from either the human placenta or the Brown-Pearce carcinoma of rabbits. Both sources proved satisfactory.—E. G. W.

DANNEEL, R. (1941). Ein Papillom-Virus aus Kaninchenhaut. **[A papilloma virus obtained from rabbit skin].**—*Naturwissenschaften.* **29.** 364–365. **103**

The work of Shope has shown that intradermal inoculation of extracts from infectious papillomas of cottontail rabbits into domestic rabbits produces tumours which frequently become carcinomatous. It is rarely possible to transmit these tumours and the reason for this loss of infectivity is not known. In a preliminary communication, D. describes experiments in which cell-free extracts of the skin of apparently healthy domestic rabbits was rubbed into the skin of other rabbits after previous scarification with sandpaper. Four of five skin extracts caused the production of tumours resembling the Shope papilloma, and cell-free extracts of these growths produced similar tumours in healthy domestic rabbits. A rabbit similarly treated with an extract prepared from its own skin developed a papilloma at the site of scarification. None of the experimental animals were at any time in contact with virus-infected rabbits and the possibility of accidental infection is considered to have been excluded.

It appears that either a virus is produced endogenously from normal cellular proteins or else the virus was present in latent form and was activated by the injury. Until the possible relationship between the new virus and that of the Shope papilloma has been decided there exists the possibility that papillomas in domestic rabbits previously described as having been induced by the Shope virus may have been in fact caused by the "*Hautvirus*".—E. G. WHITE.

DOLJANSKI, L., & TENENBAUM, E. (1942). **Studies on Rous sarcoma cells cultivated in vitro. I. Cellular composition of pure cultures of Rous sarcoma cells.**—*Cancer Res.* **2.** 776–785. **104**

TENENBAUM, E., & DOLJANSKI, L. (1943). **Studies on Rous sarcoma cells cultivated in vitro. II. Morphologic properties of Rous sarcoma cells.**—*Ibid.* **3.** 585–603. **105**

[Authors' summaries copied *verbatim*].

I. A pure culture of Rous sarcoma consists of two cell forms—spindle cells and basophilic round cells. Both are variants of one cell type. The basophilic round cell arises from a fibrocyte-like cell and may also turn into the latter. It may also become a source of large ameboid cell forms. The polymorphism of the sarcoma cell is due to the changes which it induces in the physical state of the medium. Both cell forms—the spindle and the basophilic round cell—are considered to be carriers of the Rous agent.

I. The alterations undergone by cells of the Rous sarcoma growing *in vitro* are described and illustrated. The nature and significance of these changes are discussed.

CARR, J. G. (1944). **Experiments on the inhibitor occurring in Rous no. 1 sarcomas.**—*Brit. J. exp. Path.* **25.** 56–62. **106**

Continuing his investigations [see also *V. B.* **13.** 337, and **14.** 128.] on the non-filtrability of recurring and slow-growing Rous tumours, C. concludes that the difficulty of obtaining active filtrates from these tumours is due to the presence of serum antibody to the Rous virus. This antibody combines with the virus to form floccules which are lost in the preparation of cell-free tumour extracts.—JOHN G. CAMPBELL.

See also abstr. **81-83** (carcinogens), **181-198** (avian leucosis).

DISEASES, GENERAL

SEDDON, H. R. (1943). **The influence of wild animals in the dissemination of disease of livestock in Australia.**—*Proc. roy. Soc. Qd., 1942.* **54.** 1–12. **107**

Examples are given of the part played by wild animals and birds in the dissemination of diseases among domestic livestock and man in various countries. Relatively little has been done as yet to explore this field in Australia.—D. A. GILL (AUSTRALIA).

*JOHANSSON, K. Å. (1942). Några militärveterinära rön. **[Some military veterinary problems].**—*Suom. Eläinlääkäril.* p. 10. [Abst. from abst. in *Skand. VetTidskr.* **32.** 456]. **108**

Prolapse of the penis in geldings is common in hard-worked and underfed animals; a simple operation for its correction is described.

There is reference to sand colic and notes are given concerning treatment. [From the abstract it is doubtful whether the seriousness of the condition is sufficiently emphasized, *e.g.* its intractability, and the need for sand muzzles and for precautions to ensure that the food ingested is not heavily contaminated by sand.]

Sulphanilamide is valuable in the treatment of shell-splinter wounds.

Cellulose given with concentrate foodstuff has been useful to help fodder shortage; it is readily eaten by horses.—J. E.

HINSHAW, W. R. (1943). **Diseases of turkeys.**—*Bull. Calif. agric. Exp. Sta.* No. 613. pp. 135. [Revised Edit.] **109**

This bulletin gives data on turkey diseases published from the California Agricultural Experiment Station and other sources. It is divided into sections as follows :–

principles of disease prevention, dietary diseases; fungous diseases; bacterial and virus diseases; protozoan diseases; miscellaneous diseases; worm infestation and external parasites. The prevention and control of serious epidemic diseases such as fowl pox, typhoid, pullorum disease, and some of the protozoan diseases, are dealt with very fully. The bulletin is well illustrated with 60 photographs and figures.—J. D. Blaxland.

*Krage, P., & Friedrich, H. (1942). Über eine in drei Pferdezuchtbeständen des Kreises Heiligenbeil in Ostpreussen beachtete bösartige Fohlenseuche. [**A foal disease in breeding studs in East Prussia**].—*Tierarztl. Rdsch.* pp. 374–378. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 349]. **110**

Investigations were made into a disease of foals causing heavy losses in the district of Heiligenbeil; 146 foals, 6 months to 2½ years old, were affected. *Salmonella abortus-equi*, *S. typhi-murium*, and *Bacterium equirulis* were isolated, but the lesions could not be accounted for by these infections. A virus disease was suspected, but infectious anaemia and foal influenza could be excluded. It proved possible to reproduce the disease by the inoculation of bacteria-free organ filtrates, provided that the inoculated foal carried a salmonella infection and that the material was used within a month. Mice inoculated with filtrate alone remained healthy, and those inoculated with *S. abortus-equi* alone survived 18–24 days, but when the salmonella and filtrate were inoculated together, the animals died within seven days. —U. F. Richardson.

*Momberg-Jørgensen, H. C. (1941). [**Malignant foot rot in sheep**].—*Maanedsskr. Dyrlaeg.* **53.** 317–329. [Abst. from abst. in *Tierärztl. Rdsch.* **48.** 224]. **111**

Malignant foot rot is common in Denmark, especially in West Jutland. Marshy ground favours the disease which persists in spite of a prolonged and energetic attempt to control it. *Fusiformis necrophorus* is usually present, but symptoms cannot be produced artificially with this organism.

Adult sheep are more susceptible than lambs. Damp pasture remains infective for months, but where the ground is well drained, infection dies out in about 15 days. Chronic cases act as carriers. —Ann F. Russell.

Bland, J. O. W. (1944). **Spontaneous folliculosis of the conjunctiva in grivet and vervet monkeys** (*Lasiopyga griseoviridis* **syn.** *Cercopithecus aethiops* **and** *L. pygerythra* **syn.** *C. pygerythra*) **and the susceptibility of the grivet to trachoma virus.**—*J. Path. Bact.* **56.** 161–171. **112**

Grivets and vervets are frequently affected with a spontaneous conjunctival folliculosis indistinguishable from trachoma lesions. It is pointed out that these animals are, therefore, unsuitable for trachoma investigations.—E. Cotchin.

Heath, L. M., & Byrne, J. L. (1944). **Shipping fever. I. Search for a hypothetical agent associated with pasteurella.**—*Canad. J. comp. Med.* **8.** 130–134. **113**

Fluids from the lung tissue of cattle affected with shipping fever, and containing pasteurella, did not cause disease in mice and g. pigs when administered by intranasal instillation. Pure cultures of the organism and a mixture of pure cultures and lung fluid also failed to infect mice and g. pigs, when given by this route. G. pigs were more susceptible to intraperitoneal than to subcutaneous inoculation and the presence of pleural fluid from infected lung tissue enhanced the virulence of the injected cultures. Yearling cattle were exposed to infection by introducing 0·1 ml. of material into the trachea by means of a nebulizer attached to a needle, filtrate of infected lung containing a few pasteurella, pure culture of pasteurella, and a mixture of these being used; in all instances there was failure to produce infection, but the animal which received the filtrate showed a rise of temperature on the fourth and fifth days after exposure. The small infecting doses employed may have had a bearing on the absence of symptoms.—R. Gwatkin (Canada).

Bing, J., & Neel, A. V. (1942). **On the site of production of pathologically increased globulin as elucidated by conditions in cerebro-spinal fluid.**—*Acta med. scand.* **111.** 57–65. [In English]. **114**

During recent years several workers have reported that diseases in which there occurs a rise in serum globulin are accompanied by accumulations in affected tissues of plasma cells and other cells of the reticulo-endothelial system [the authors apparently consider plasma cells as belonging to the r.e.s.]. This has led to the suggestion that these cells form serum globulin. In this article the authors compare the protein content of the cerebrospinal fluid in various affections of the central nervous system with the cellular reaction which occurs. A rise in globulin in the c.s.f., unaccompanied by a rise in albumin, occurs only in those diseases in which plasma cells are a characteristic feature of the cellular reaction. On the basis of this finding, it is suggested that these cells form the globulin of both serum and c.s.f.—E. G. White.

Jetter, W. W., & McLean, R. (1943). **Biochemical changes in body fluids after death.**—*Amer. J. clin. Path.* **13.** 178–185. **115**

An interpretation of chemical analyses of P.M. material must take into account the nature and extent to which P.M. change may have contributed to apparent abnormalities. The authors discuss the significance attached to analytical P.M. figures in relation to the substances frequently encountered and/or estimated in human forensic medicine.

Carbon monoxide.—The lethal blood concentration varies from 30–80%, with progressive loss after death of about 5% each 24 hours. CO is not absorbed after death in the cadaver exposed to an atmosphere containing carbon monoxide; carboxyhaemoglobin formation is not incident to putrefaction.

Chlorides and magnesium.—Even before putrefaction, plasma chloride decreases to whole blood level and continues to fall due to extravascular effusion. Mg commences to shift after death from the red blood corpuscles, and as putrefaction advances, the whole blood Mg content increases, due to extravascular diffusion; the increase may be 800% within 72 hours.

Creatine.—Except in children, and intermittently in the urine of normal adult females, creatine occurs only concurrently with an unusual breakdown of body tissues, *e.g.* in starvation, diabetes, exophthalmic goitre and muscular dystrophies. It is not formed in the urine during P.M. change, but, if present, is detectable up to 24 hours after death.

Glucose.—This decreases P.M. as a result of glycolysis at a rate of 13 mg. per hour at 37·5°C. and more slowly at lower temperatures. Blood from the right side of the heart may show values of 500–600 mg. %, due to P.M. liver glycogenolysis, depending upon the liver glycogen reserve. Hypoglycaemia is normally found in asphyxia, shock, head injury, and coronary thrombosis. At 37° C. urinary sugar destruction is about 50% in the first 12 hours after death with an additional loss of 25% during the subsequent 12 hours.

Ketone bodies.—These are not formed in the urine as a result of putrefaction. If present before death, acetone and aceto-acetic acid disappear gradually over a period of 48 hours P.M., but the concentration of

β-hydroxybutyric acid is relatively constant for three days after death.

Non-protein nitrogenous substances.—N.P.N., urea, and creatinine are not increased within the first 12 hours by more than 40% of the *ante-mortem* level; later, with putrefaction, there are large N.P.N. increases. With the onset of putrefaction, blood uric acid decreases.

Oxygen.—This occurs in a high concentration following death from sudden cardiac arrest. 80% of the O_2 present may disappear within four hours; O_2 is not taken up by the heart blood after death.

—Alex. B. Paterson.

Merillat, L. A. (1944). **Azoturia: suggestive pathology.**—*J. Amer. vet. med. Ass.* **104.** 223–224. **116**

M. discusses some of the features of equine myoglobinuria as they appeared to him and to his contemporaries some 40 years ago. He refers to the fact that the gluteal muscles which are the main site of the "myopathic catastrophe" do not subsequently atrophy, whereas the rectus femoris and vasti become paralysed and atrophied and recover only after several months. The explanation put forward was that the swollen gluteus maximus damaged the crural nerve by pressure against the bone and caused sufficient damage to result in paralysis from which recovery occurred only as the nerve axons were able to regenerate. Thus azoturia showed two phases, *viz*, a primary myopathic phase related to carbohydrate metabolism of the gluteal muscles, and a secondary neuropathic phase affecting the crural muscles which appeared to be due to trauma of the crural nerve.

No form of curative treatment has proved of much value. Prevention consists in avoiding sudden rest in hard-worked horses and in stopping the animal immediately the first symptoms of the condition are seen, since the "sinking gait" aggravates the nerve trunk injury. M. has never seen a case which was strictly unilateral prove fatal: few bilateral cases have recovered.—E. G. White.

I. Wallgren, I. (1943). Beobachtungen über den feineren Bau und die Funktion der menschlichen Zelle unter normalen and pathologischen Verhältnissen. **[The finer structure and the function of the human cell under normal and pathological conditions].**—*Acta. path. microbiol. scand.* **20.** 754–775. [In German]. **117**

II. Wallgren, I. (1943). Über einige nekrobiotische Erscheinungen bei den neutrophilen und eosinophilen Granulozyten. **[Necrobiotic manifestations in neutrophile and eosinophile granulocytes].**—*Ibid.* 776–790. [In German]. **118**

I. W. has studied the cytological features of various cells, especially leucocytes, using supravital staining with brilliant cresyl blue and examining on a warm stage both by dark-ground illumination and by transmitted light. The characteristic neutrophile or eosinophile granules of leucocytes do not show active movements, but are carried passively by an actively moving cytoreticulum. The latter contains white granules which stain with cresyl blue and appear with dark-ground illumination as refractile structures. There is reason to believe that the cytoplasm thus consists of two systems—an actively motile system, almost certainly fluid in character, which conveys materials throughout the cell, and a passively motile system which comprises the specialized cytoplasmic inclusions such as the granules of leucocytes. Amoeboid movements of the cell are brought about by the actively motile system. A variety of other cells from normal and pathological tissues showed a similar basic cytoplasmic structure. The actively motile system, with its white granules, which W. describes, appears to have escaped attention hitherto because it is difficult to stain, whereas the passively motile system is easily stained and has long been recognized. Since the granules of leucocytes are passively carried within the cell by movements of the actively motile system, it is clear that the view that these granules are united by delicate fibres to form a cytoreticulum is untenable.

The features of the various structures are illustrated by photomicrographs taken by dark-ground and ordinary illumination.

II. Seyderhelm, in 1925, using a mixture of congo red and trypan blue, claimed that living and dead leucocytes could readily be distinguished. Living leucocytes are impermeable to the dyes whereas dead or dying cells are intensely stained. W. has studied this problem anew, using as a criterion of living cells the movements of the "actively motile system" and the neutrophile granules of leucocytes described in I. The results showed that colloid dyes do not enable living and dead or dying leucocytes to be distinguished. If living leucocytes are provided with dye of a suitable concentration, so that the cell is not damaged, they take up the stain and become coloured. This applies to congo red; trypan blue is extremely toxic to leucocytes and its presence in Seyderhelm's stain probably prevented the congo red from penetrating the cells. Recent work fails to support the view that leucocytes possess a definite cell membrane.

The nuclear and cytoplasmic changes occurring in degenerating leucocytes are described. It is probable that oxydases and also proteolytic enzymes occur in the granules of leucocytes, the latter enzymes being responsible for the characteristic effect of pus cells on proteins. It is of interest that leucocytes kept as a suspension for a month still showed their characteristic granules and the adjacent plasma showed fine fibrin threads, suggesting that the proteolytic enzymes were still confined with the cells. Experiments are required to show how, in pathological processes, the proteolytic enzymes are able to escape from the cell and to produce tissue breakdown.—E. G. White.

Kobozieff, N., Pomriaskinsky-Kobozieff, N. A., & Dupont, A. (1943). Génétique et stérilité. **[Sterility and genetics].**—*Rec. Méd. vét.* **119.** 49–56. **119**

A discourse on some of the causes of sterility in animals which have been shown to have a hereditary basis. The article contains neither new data nor any original viewpoint.—N. J. Scorgie.

Gregory, P. W., Mead, S. W., & Regan, W. M. (1943). **A congenital hereditary eye defect of cattle.**—*J. Hered.* **34.** 124–128. **120**

During inbreeding experiments with Jersey cattle [see *V. B.* **13.** 394 & 395.] a hereditary type of cataract was discovered, involving 16 closely related animals. In the affected cattle, irrespective of age, the lens was dislocated and smaller than normal. In calves the cataract was of the perinuclear type, while in the adult the cataract had progressed to the mature stage. A description is given of the gross appearance of the lesions as seen in the living eye; histological details are also given for cataractous eyes obtained from a calf and an adult cow. In affected animals there is apparently a considerable reduction in vision, which leads to a marked excitability and consequent lowered milk production. An analysis of the pedigrees of the animals involved indicates that the eye abnormality is hereditary and conditioned by a single autosomal recessive gene. The authors state that the condition described appears to be identical with a similar eye anomaly previously described in Friesian cattle in 1920 by Detlefson & Tapp.—N. J. Scorgie.

STEINER, H. (1941). Doppelkopfbildung beim Kalbe. **[Twin heads in calves].**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **85.** 377]. **121**

S. discusses the origin of the condition, describes his observations on six cases, with illustrations, and examines the hereditary background. Identical twins and twin-headed foetuses have their origin in a single ovum and possess a single chorion. They are always of the same sex. This condition occurs twice as commonly in females as in males. Anterior duplication is far commoner than posterior duplication.

According to the modern viewpoint on the origin of the condition, development is normal up to the morula stage. Then either there arise from the morula two independent embryonal nodes, or there develops only one node from which two or more embryonal axes grow. Little is known about the precise cause of twin heads. The prevailing opinion, however, is that the critical time is the very early stage of embryo-differentiation, the so-called " teratogenetic period ", extending up to the time of gastrulation. Little attention has been paid to intrinsic causes, *e.g.* inferior germ cells and genes. If the former set of hypotheses is accepted, twin formation becomes classified in the large group of developmental aberrations, a viewpoint which is confirmed by the fact that twinning often occurs in conjunction with developmental abnormalities. Every case of twin heads cannot, however, be ascribed to errors in development. The part played by the genes, with probable recessive tendencies, remains undetermined, owing to the scarcity of suitable material for examination.—D. N. SPRIGGS.

See also abstr. **225** (disease control in Brazil), **226** (livestock diseases in Sweden), **234** (in Ceylon), **236** (in Panama), **227** (sheep diseases in Scotland), **233** (poultry diseases in Manitoba), **144, 145** (infertility), **226** (bloat in cattle), **128** (heritability of predisposition to rickets), **122-124** (liver disease).

NUTRITIONAL AND METABOLIC DISORDERS

GOETTSCH, E., LYTTLE, J. D., GRIM, W. M,. & DUNBAR, P. (1942). **Amino acid studies. I. Plasma amino acid retention in the hypoproteinemic dog as evidence of impaired liver function.**—*J. biol. Chem.* **144.** 121–134. **122**

LYTTLE, J. D., GOETTSCH, E., GREELEY, D. M., GRIM, W. M., & DUNBAR, P. (1943). **Amino acid studies. II. Plasma amino acid retention, as evidence of impaired liver function—investigations in children with nephrosis and liver disease.**—*J. clin. Invest.* **22.** 169–181. **123**

GOETTSCH, E., LYTTLE, J. D., GRIM, W. M., & DUNBAR, P. (1943). **Amino acid studies. III. The reversibility of plasma amino acid retention during recovery from dietary hypoproteinemia in the dog.**—*J. biol. Chem.* **151.** 149–152. **124**

I. Casein hydrolysate was administered either intravenously or by stomach tube to dogs which had been rendered hypoproteinaemic. The subsequent clearance of amino acids from the plasma was much lower than in normal dogs. Evidence was obtained, however, that the metabolism of the hydrolysate remained essentially unaltered throughout the course of progressive hypoproteinaemia. Neither in normal nor in hypoproteinaemic dogs did intravenous injection of the hydrolysate stimulate urea clearance.

No correlation was found between the plasma amino acid N level and the plasma albumin value in hypoproteinaemic dogs. The plasma amino acid N level was maintained at the normal level for long periods in face of severe hypoalbuminaemia.

II.' The fasting plasma amino-acid N in 45 normal children was found to range from 2·92 to 4·63 mg. per 100 ml. Amino-acid loading curves following the intravenous injection of a 10% solution of casein hydrolysate were constructed for these children, and for patients with nephritis. The results indicated that whereas many of the patients with liver damage showed a delay in clearing the plasma of amino-acids, severe impairment of renal function was no obstacle to clearance.

III. A young bitch weighing 13·8 kg. was provided with a low protein carrot diet as previously described by WEECH *et al.* (1935). As hypoproteinaemia developed, the ability of the animal to clear the plasma of α-amino acid N (following test intravenous injections of casein hydrolysate) diminished. Following the addition of 45 g. casein per day to the diet the serum albumin level was restored and the " amino acid loading curve " quickly returned to normal.

The comment is made that since in the hypoproteinaemic dog plasma amino-acid retention is closely correlated with liver injury [see I], the changes observed in the above animal are presumably evidence of a reversible disturbance of liver function.—A. N. WORDEN.

O'CONNOR, J. D. (1944). **Effects of mineral deficiencies in the diet of livestock.**—*Vet. Rec.* **56.** 337–341. Discussion pp. 341–342. **125**

An article of a review nature with no new contribution to the subject.—ALEX. B. PATERSON.

HAMMOND, J. C., MCCLURE, H. E., & KELLOGG, W. L. (1944). **The minimum phosphorus requirements of growing turkeys.**—*Poult. Sci.* **23.** 239–241. **126**

The data obtained in experiments involving 240 turkey poults indicated that it is not necessary to provide growing turkeys with a diet containing more than 0·6% of phosphorus, and that under most conditions they may be fed a diet containing as little as 0·5% phosphorus without detrimental effect.—E. M. CRUICKSHANK.

HATFIELD J. D., SHREWSBURY, C. L., ANDREWS, F. N., & DOYLE, L. P. (1944). **Iodine-fluorine relationships in sheep nutrition.**—*J. Anim. Sci.* **3.** 71–77. **127**

Three experiments were carried out in order to investigate the effects of feeding various levels of fluorine in conjunction with rations containing adequate and inadequate amounts of iodine. In each experiment, four groups of five lambs were used. Rock phosphate containing 3·85% F was fed to three of the groups in each experiment in amounts that would furnish 1·5, 3·0, and 6·0 mg. F respectively per kg. body weight daily for periods of 170, 235, and 180 days. The Ca and P content of all feeds was adjusted to an equal level by the addition of steamed bone meal. In the first experiment, the lambs were allowed free access to block salt which contained some iodine ; in the second, the salt fed contained no I_2 and in the third experiment I_2 was supplied in iodized salt. In all three experiments the lambs which received the greatest amount of F grew less rapidly than the controls on a fluorine-free ration but growth was affected to a lesser degree in the lambs receiving the smaller amounts of F. Addition of I_2 did not counteract the effect of F on the growth.

Chemical and histological examination of the lambs' thyroids showed that the lambs in experiments 1 and 2 which did not get iodized salt, were deficient in I_2.

Thyroid weight was decreased by the addition of F to the I_2-low rations fed in experiments 1 and 2, and the smallest glands were obtained from the lambs receiving the greatest amount of F, but in the third experiment where all the lambs were fed equal amounts

of iodized salt the addition of F resulted in no significant differences in thyroid weight. In each experiment the addition of F did, however, increase the percentage of I_2 in the thyroid gland even when I_2 intake was controlled, but the total I_2 content of the gland was not consistent in the three groups since it increased with F intake in experiment 1 and decreased in 2, and a variable effect was obtained in experiment 3.

The thyroids of the lambs in experiment 3 whose rations were supplemented with iodized salt were normal in I_2 content and microscopic structure.

It is suggested that earlier disagreement in the literature concerning thyroid size and F intake may have been due to a variable I_2 content of the basal rations employed.—R. Allcroft.

Raghavachari, K. (1944). **Some observations on rickets in pups.**—*Indian J. vet. Sci.* **13.** 137–141. **128**

In the experimental kennel at Mukteswar a bitch of unknown ancestry produced within seven years six litters of pups which developed typical rickets, as shown by clinical symptoms and analyses of serum and femur and ribs. A change of sire brought no improvement, but dosing the bitch during pregnancy with cod liver oil prevented the condition. Some rickety pups also improved when put on cod liver oil; for others the oil supplemented with calcium was necessary. All other bitches produced normal pups under similar conditions of feeding and management. It is suggested that the condition was hereditary on the maternal side, due to a depleted vitality predisposing the young to rickets. —N. D. Kehar (India).

Sanford, T. D., & Jukes, T. H. (1944). **Further observations on the vitamin D requirement of turkey poults.**—*Poult. Sci.* **23.** 221–223. [See also *V. B.* **11.** 51]. **129**

The vitamin D requirement for maximum calcification at four weeks of age was approximately 200 A.O.A.C. [Association of Official Agricultural Chemists] units when a U.S.P. reference cod liver oil (no. 2) was used. When a blend of fresh oils (sardilene 400) or an irradiated animal sterol (detosterol) was used, the requirement was somewhat lower. In poults receiving low levels of vitamin D, there was a high incidence of crooked breast bones at four weeks of age.—E. M. Cruickshank.

Burt, A. S. (1943). **Growth of spinal ganglia in plasma from vitamin B_1-deficient chickens.**—*J. cell. comp. Physiol.* **22.** 205–222. **130**

When spinal ganglia from chick embryos 9–15 days old were grown in plasma from vitamin B_1 deficient chicks, the length and density of the nerve fibres and the density of the spindle cells were significantly reduced in comparison with those of ganglia cultured in normal plasma. The addition of vitamin B_1 chloride to deficient plasma, at the rate of 4 mg. per 100 ml., permitted of increased density of the spindle cells but was without effect upon the nerve fibres. Addition of pyruvic acid, lactic acid, acetaldehyde or acetoacetic acid to normal plasma, at the rate of 50 mg. per 100 ml., was without effect upon the growth of the ganglia. —A. N. Worden.

Rudra, M. N. (1944). **Role of manganese in the biological synthesis of ascorbic acid. [Correspondence.]**—*Nature, Lond.* **153.** 743–744. **131**

Seeds of *Phaseolus radiatus* when germinated in solutions containing minute amounts of manganese showed an increased synthesis of indophenol-reducing substance as compared with seeds germinated in distilled water or in solutions of sodium chloride or magnesium sulphate. That this substance was identical with vitamin C was shown by experiments on g. pigs, close agreement in weight increase being obtained over a three-week period in three groups of animals on a scorbutic diet, supplemented with (1) 0·5 mg. synthetic ascorbic acid, (2) an amount of *P. radiatus* germinated in distilled water and calculated to contain 0·5 mg. of total ascorbic acid, or (3) an amount (smaller) of *P. radiatus* germinated in 0·002% manganese solution and calculated to contain 0·5 mg. total ascorbic acid. In another experiment, two groups of g. pigs (five in each) on the scorbutic diet were injected intraperitoneally with (1) 25 mg. glucose in 0·5 ml. of distilled water, or (2) 25 mg. glucose dissolved in 0·5 ml. of 0·04% manganese solution. Injections were given daily for 14 days. The animals were then killed, the histological structure of the teeth examined, and the degree of protection against scurvy judged according to the Key and Elphick scale. The animals in group (1) showed no degrees of protection, while those in group (2) showed an average of 3 degrees of protection. R. concludes from these results that the animals injected with glucose in manganese solution had synthesized ascorbic acid, and that manganese is indispensable for the synthesis of the vitamin in both plants and animals.—E. M. C.

Patton, J. W. (1944). **Acetonemia, a vitamin A deficiency.**—*Vet. Med.* **39.** 150–153. **132**

This is a preliminary report on the occurrence of acetonaemia in cows in the southern states of the U.S.A. The incidence of the disorder is greatest where vitamin A is deficient in the ration. It is claimed that the symptoms of uncomplicated acetonaemia resemble those of avitaminosis A. Some evidence is presented in favour of vitamin A therapy in acetonaemia, the suggested dose being 100,000–250,000 I.U.—A. B. P.

Shaw, J. C. (1943). **Studies on ketosis in dairy cattle. V. The development of ketosis.**—*J. Dairy Sci.* **26.** 1079–1090. [For part IV, see *V. B.* **12.** 600]. **133**

Blood glucose and acetone bodies were determined both before and after parturition in 16 Holstein cattle; 12 of these developed some degree of ketosis, although only seven exhibited clinical symptoms. In all cases the development of hypoglycaemia and ketonaemia began 1–3 days after parturition and continued for 4–10 days before the most marked hypoglycaemia was observed. Previous to parturition, blood glucose values were within the normal range and no ketonaemia was present. Intravenous injection of 0·5 ml. of 1 : 1,000 adrenalin, both before and after the onset of ketosis, only raised the blood glucose level from its pre-injection value by about 10 mg. %, while in normal animals an increase of 30 mg. % was obtained; this was taken as an indication that liver glycogen is markedly depleted in affected animals both before and after the onset of ketosis. Glucose injected intravenously (20 g. per 100 lb. body weight) was removed from the bloodstream with equal efficiency (within two hours) in normal cows and in those with ketosis, and maintenance of a high glucose intake prior to, and following, parturition did not prevent the onset of ketosis. The mammary gland continued to remove a normal quantity of glucose from the blood even in marked hypoglycaemia, and, together with the low liver glycogen content at parturition, the sudden increase in mobilization of glucose required with the initiation of milk secretion is probably a major factor in the development of ketosis.—Alex. B. Paterson.

*Lévesque, L. (1943). Contribution à l'étude de la cétose des bovidés. **[Ketosis in cattle].**—*Thesis, Alfort.* [Abst. from abst. in *Rec. Méd. vét.* **119.** 124]. **134**

A general account, with apparently no significant contribution to the knowledge of the subject.—A. B. P.

See also absts. **162** (biochemistry of nutrition), **238** (wartime animal feeds and vitamin supplements), **34, 35** (relation of biotin and avidin), **184** (folic acid).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Lo Russo, R. (1943). Contribución al estudio leucocitario de la sangre y leche proveniente de vacas normales. **[Leucocyte content of the blood and milk of normal cows].**—*Rev. Med. vet., B. Aires.* **25.** 498–508. **135**

A differential leucocyte count of the blood of ten normal cows gave the following results :– lymphocytes 49·59%, monocytes 8·65%, neutrophiles 28·86%, and eosinophiles 12·88%. [The lymphocyte count is wrongly given as 39·59%.]

A combination of these results with those of other authors gives the following averages :– lymphocytes 44% [corrected], monocytes 16%, neutrophiles 32%, and eosinophiles 9%.

The leucocyte count of normal milk from the same cows was :– lymphocytes 27·2%, monocytes 19·1%, neutrophiles 50·1%, and eosinophiles 3·3%.

—Isobel W. Brocklehurst.

Mullick, D. N., & Pal, A. K. (1944). **Studies on the composition of the blood of farm animals in India. I. A study of some haematological and chemical constituents in the blood of normal cattle.**—*Indian J. vet. Sci.* **13.** 146–149. **136**

Blood from 143 male and female cattle was examined with the following results :– red blood cells 11·6–8·1 million, leucocytes 13·1–9·0 thousand per cu.mm., haemoglobin 14·6–10·9 g. % Newcomer, Fe 49·1–39·6 mg. %, P 5·92–4·26 mg. %, serum Ca 13·0–11·2 mg. %, serum Mg 2·46–2·51 mg. %, and sugar 99·9–77·7 mg. %.

Calves showed higher values of almost all constituents. There was no significant variation during lactation or pregnancy.—A. K. Pal (India).

Rhian, M., Wilson, W. O., & Moxon, A. L. (1944). **Composition of blood of normal turkeys.**—*Poult. Sci.* **23.** 224–229. **137**

A study was made of the blood composition of turkey cocks, of turkey hens having high and low fertility and hatchability records, and of laying and non-laying birds. Blood samples were collected at intervals over a period of two months, the constituents estimated being vitamin A, vitamin C, carotene, Ca, P, glutathione, sugar, haemoglobin, haematocrit values, and plasma protein. Plasma vitamin C values for 60 turkey hens on four different adequate diets were also obtained on one date, the values ranging from 0·04–1·67 mg. per 100 ml. No relationship was observed between blood constituents and fertility and hatchability of the eggs, except for haematocrit values. Considerable variation between individual hens was noted, particularly with regard to P, haemoglobin, haematocrit, Ca, and carotene values. Plasma Ca was consistently higher in laying than in non-laying birds, but no other difference in blood constituents was noted. The blood composition of normal cocks was very similar to that of the hens.

—E. M. Cruickshank.

Hueper, W. C. (1944). **Reactions in the blood and organs of dogs on intravenous injections of a solution of hemoglobin.**—*J. Lab. clin. Med.* **29.** 628–632. **138**

Intravenous injection into dogs, weighing 8·2–10 kg., of a 2% solution of haemoglobin in normal saline (20 ml.), produced an immediate transitory leucopenia with relative lymphocytosis, a secondary leucocytosis with absolute neutrophilia within 24 hours, increased sedimentation rate, and lengthened coagulation time.

Repeated and prolonged intravenous administration of haemoglobin solution (daily injection five times per week, the dose rising from 20 ml. to 70 ml. over a period of five weeks) produced slight loss of weight, decrease in the number of erythrocytes and amount of haemoglobin, excessive leucocytosis at times, and accelerated erythrocyte sedimentation. The first injection of haemoglobin solution was followed by restlessness, dyspnoea, rapid pulse, vomiting, and diarrhoea, but no subsequent injection elicited such a response. Except for increased pigment in the cells of the reticulo-endothelial system, all the internal organs and the brains of the dogs proved normal on P.M. examination. These reactions to haemoglobin solution resemble those following parenteral administration of a solution of other macromolecular substances.—A. B. Paterson.

Wright, H. P. (1944). **The sources of blood platelets and their adhesiveness in experimental thrombocytosis.**—*J. Path. Bact.* **56.** 151–159. **139**

The increase in the blood platelet count which follows major surgical operations is now well recognized. Recently, it has been shown that a maximum of stickiness of these blood elements coincides with the peak in their numbers, and it was suggested [Wright (1942)] that this change in their adhesive properties was probably due to a change in the character of the platelets themselves and not to any alteration in the plasma. The present observations were made to test the validity of this hypothesis by means of intravenous injections into rabbits of solutions of pyridine and adrenalin, which cause new platelets to be thrown out into the circulation. In the intact animal a rise in the number of platelets was observed after both drugs, but the thrombocytosis produced by pyridine was accompanied by an increase of the stickiness of the platelets, while that caused by adrenalin showed no such alteration. After splenectomy, the platelet count rose for 7–10 days and was accompanied by an increase in the stickiness. During this post-operative period, pyridine evoked a response which was least marked when the number and stickiness of the platelets were maximal in response to the surgical trauma. As the platelet count returned towards normal, the effect of pyridine again became pronounced. After splenectomy, adrenalin had no effect upon the number or stickiness of the platelets. W. suggests that these two drugs act upon different sources of platelets, adrenalin causing a rapid outpouring of mature platelets from depots in the spleen, and pyridine, like the stimulus of surgical trauma, increasing the output of new platelets from the bone marrow, and that these young elements exhibit greater adhesiveness than those of greater age.—N. J. Scorgie.

Bloom, F., & Meyer, L. M. (1944). **The morphology of the bone marrow cells in normal dogs.**—*Cornell Vet.* **34.** 13–18. **140**

Bone marrow smears were prepared from material obtained by aspiration through a needle inserted into the medullary cavity of the crest of the ilium. The smears were stained by the methods of Wright or May-Grünwald-Giemsa and a differential count was made of 500 nucleated cells. The various types of cell are described and a table is provided giving the distribution of the cells in both peripheral blood and bone marrow. There are no illustrations and the number of normal dogs studied is not mentioned.—E. G. White.

Madonick, M. J., & Newman, B. (1943). **The explanation for the absence of clotting in bloody cerebrospinal fluid.**—*J. Lab. clin. Med.* **28.** 1809–1811. **141**

It is known that human cerebrospinal fluid from cases of subarachnoid haemorrhage does not clot on standing, whereas c.s.f. mixed with blood caused by trauma occurring during lumbar puncture clots readily. A study of fresh c.s.f. from cases of arachnoid haemor-

rhages showed that the only factor required for normal blood coagulation which was lacking was fibrinogen. Normal c.s.f. does not contain fibrinogen, and it is suggested that the clot which forms in the cranial cavity contains all the fibrinogen and thus the "blood" found in the c.s.f. on lumbar puncture consists merely of blood cells and serum.—E. G. WHITE.

I. ADLER, H. F., & TEMPLETON, R. D. (1940). **The correlation of activity and transportation in the colon of the dog.**—*Amer. J. Physiol.* **128.** 514–520. **142**

II. ATKINSON, A. J., ADLER, H. F., & IVY, A. C. (1943). **Motility of the human colon.**—*J. Amer. med. Ass.* **121.** 646–651. Discussion 651–652. **143**

I. Experiments were carried out on five dogs previously subjected to caecostomy and trained to lie quietly for several hours at a time on a cushioned table. A balloon which measured, when not inflated, 10 cm. in length and 4 cm. at its widest diameter was inserted into the proximal colon through the caecostomy opening, and movements of the caecum were recorded by means of a water manometer connected to the balloon. Movements of the distal colon were studied by using a similar balloon inserted through the anus for a distance of 16–18 cm. Transport of the balloon was measured by noting the movement of a thin graduated rubber tube leading from the balloon to the manometer. In each case changes in pressure in the balloon were compared with transportation of the balloon along the colon. With few exceptions, it was found that transportation was intimately related to the periods of colon activity, these periods varying in duration from 1–136 min. (83% were of 20 min. or less). Propulsion is not necessarily related to the intensity of the periods of activity: periods of low intensity may be very effective in propelling material while vigorous activity may effect little propulsion. Rate of transport of a bolus is greatest in the most proximal segments of the colon.

The essential periodic nature of colon activity described by other workers was thus confirmed. This periodicity applies to any given segment and is independent of the activity in all other segments. The authors have now shown that these periods of activity are important in propelling material along the colon.

II. The authors have made a detailed study of the movements of the colon, by the insertion of balloons through colostomy openings in human subjects and in unanaesthetized dogs [see I].

Subcutaneous injection of morphine is followed by increase in tone and non-propulsive motility: propulsive motility is decreased or abolished. Of a variety of "antispasmodic" drugs which were investigated the most effective were atropine sulphate and trasentin (a synthetic alkaloid with an atropine-like action—diphenylacetyl - diethylaminoethanol hydrochloride). Trasentin was particularly effective in improving co-ordination between movement in different segments and in establishing a gradient for normal propulsion.

During the discussion, ATKINSON stated that intramuscular injection of posterior pituitary extract (1·25 units), together with prostigmine methylsulphate (0·25 mg.) and ergotamine tartrate (0·25 mg.) caused a prompt increase in motility in the human colon and was useful in cases of colonic stasis.—E. G. WHITE.

—. (1944). **[Discussion on] Principles affecting the reproductive functions.** [Speakers: HAMMOND, J., FOLLEY, S. J., DAY, F. T., & GOULD, G. N., Jr.]—*Vet. Rec.* **56.** 41–46. **144**

HAMMOND stated that the elements of the reproductive cycle through which fertility can be controlled are mainly confined to three:– (1) the number of ova which are produced and ripened, (2) the number of ova which become fertilized, and (3) the number of fertilized ova which develop normally to birth. He then reviewed some of the factors which may operate at each stage, including such considerations as age of the animal, breeding season, feeding, lactation, and the time relation between mating and ovulation. He cited a case in which administration of progesterone was apparently effective in maintaining gestation in a mare which previously had regularly aborted.

FOLLEY reviewed the actions of the pituitary gonad-stimulating hormones and, in particular, referred to experiments in progress in Great Britain on the effect of pregnant mare's serum [P.M.S.] on the ovaries of heifers undergoing regular oestrous cycles.

DAY dealt with some of the factors leading to sterility in the mare and with the methods of treatment adopted. With regard to anoestrus in cattle, he stated that the injection of P.M.S. induced oestrus with ovulation in 25% of cases treated.

GOULD discussed breeding problems in dairy cattle from the point of view of general management and handling of the parturient animal. He also referred to *Brucella abortus* infection in the bull, *Corynebacterium pyogenes* infection of the genital tract, and trichomoniasis.

In the general discussion, STEELE-BODGER stated that he had had greater success with P.M.S. than that cited by DAY. AMOROSO directed attention to the limitations in knowledge regarding the viability of the spermatozoa, their fertilizing powers, and the influence which they exert upon the ovum prior to fertilization. He further pointed out that the fate of the ovum depends at all times upon its nutrition which is affected by endometrial reactions and upon the perfection of the embryo's own auxiliary devices for attachment. He could not agree with what HAMMOND had said about the leisurely transit of the ova through the upper part of the tube, and gave specific times for the length of the tubal sojourn of the egg in several species of domestic mammals.—N. J. SCORGIE.

PHILLIPS, R. W., & ZELLER, J. H. (1943). **Sexual development in small and large types of swine.**—*Anat. Rec.* **85.** 387–400. **145**

Previous studies [*V. B.* **12.** 503.] had indicated differences in reproductive capacity between the small and large types of the Poland China breed of swine. Thus, more difficulty had been experienced in maintaining normal reproduction in the small than in the larger types; libido appeared to be less pronounced in the small type. There was also a highly significant difference in litter size, the average number being 7·4 in the large type as compared with 5·8 in the small. The present study was undertaken in order to determine some of the basic reasons for the apparent differences in reproduction between the two types. Forty-four large- and 35 small-type boars were castrated at ages varying from 5–40 weeks, and the testes submitted to histological examination.

Spermatozoa were first observed in the seminiferous tubules at 20 weeks and were present in all boars observed at 25 weeks. Rapid development of the germinal epithelium began after approximately 17·5 weeks of age. There was no clear-cut difference between the two types as regards the age at which spermatozoa were first produced. Some evidence, however, was obtained from that point onwards that the development of the testes may be more variable in the small type, and that the final development of the testes at maturity may not be as great in the small type, as judged by actual and relative weight and by diameter of the seminiferous tubules. Twenty-four small- and 39 large-type gilts were observed daily for oestrus from shortly after weaning until the first oestrous period was

noted. Gilts of the small type showed first oestrus at an average age of 207·8 days and an average weight of 189·5 lb. For the larger type the averages were 198·7 days and 199·3 lb. Differences between the two types in average age and weight were not statistically significant. When adjusted to a common weight level, the large type showed oestrus at 195·1 days as compared to 211·5 in the small type, and these means differ significantly. The authors state that the findings reported, and also observations based on breeding experience with the two types, indicate a lower level of sexual activity in the small type. It is suggested that there may be a lower level of pituitary gland activity in the small type.—N. J. Scorgie.

Willett, E. L. (1942). **Studies on the preservation and the physiology of spermatozoa.**—*Cornell Univ. Abstr. Theses, 1941.* pp. 489–491. **146**

The material of this thesis, dealing with the effect of various diluters, cooling rate, and temperature of storage on the livability of spermatozoa in stored samples of bull semen, has been presented in extended form elsewhere [see *V. B.* **14.** 280]. The results of an investigation into the bacterial count of bull semen collected by the artificial vagina have also been published before [see *V. B.* **12.** 370].—N. J. Scorgie.

Rowson, L. E. A. (1944). **A year of artificial insemination.**—*Vet. Rec.* **56.** 165–167. **147**

A review of the development of the Cambridge experimental centre, which started in November 1942 with two bulls, negative reactors to the tuberculin test and to tests for *Brucella abortus* infection, and carefully checked as to quality of ejaculate. A nymphomaniac cow, also a negative reactor to the tuberculin and brucella agglutination tests, was available to assist in sperm collection. The artificial vagina used is shorter than the usual type; details are given of the advantages claimed for this type. The sample is diluted according to the sperm-count, usually about 1 : 6, fresh egg-yolk being added to a stock phosphate solution for each sample of semen.

Five bulls are now in use; the original two have given well over 100 ejaculations each, and have been able to serve at intervals of 2–3 days.

Long distance transport of semen gave poor results. For short distances, semen is carried with ice in a vacuum flask. For insemination a special pipette (which is described) is used, joined to a glass syringe by a short length of rubber tubing; the semen does not come into contact with either the rubber tubing or the syringe. The pipette is passed through the cervical canal, its position being checked by a hand in the rectum. A fresh sterile pipette is used for each cow. The use of a speculum (difficult to sterilize), is thus avoided, and there is no risk of semen flowing back into the vagina.

The conception rate, in some hundreds of inseminations, was somewhat higher than that expected from natural services.

Details are given of the recording system used. The density of the cattle population is low in Cambridgeshire; it was necessary to travel 38,000 miles in a year to carry out this work—an average of 25 miles per cow inseminated.—F. L. M. Dawson.

Parkes, A. S. (1943). **Induction of superovulation and superfecundation in rabbits.**—*J. Endocrinol.* **3.** 268–279. **148**

The experiments reported in this paper first show that a series of daily injections with a horse pituitary extract (" priming process ") will considerably increase the number of mature follicles in the ovaries of adult rabbits. The optimum duration of the priming process was found to be five days; further injections evoked insensitivity to the extract which could not be overcome by a drastic increase of dosage. Mating of the primed female caused ovulation of a number of follicles much in excess of normal. Maximal ovulation from the primed ovary could be obtained without mating by the intravenous injection of 20 I.U. of chorionic gonadotropin. Superfecundation, as shown by the presence of large numbers of embryos at the end of the first third of pregnancy, was produced in many of the primed and mated rabbits, most of which also received an intravenous injection of chorionic gonadotropin to assist ovulation. In most of the superfecundated rabbits examined at the 16th day of gestation, the majority of the embryos were being resorbed, and in five rabbits allowed to go to full term, the number of living young born was considerably less than would have been expected if the rabbits had not been subjected to treatment. P., in discussing possible causes for the holocaust of embryos, states that the reasons why the uterus is unable to support the growth of supernormal numbers of embryos are not clear, but in view of the stage of pregnancy at which regression seems to have taken place in the experiments cited, it is unlikely to be primarily of mechanical or metabolic origin. The suggestion is made that an explanation should be sought in the possible inadequacy or insufficiency of the hormonal factors necessary for the maintenance of pregnancy.

—N. J. Scorgie.

Rowlands, I. W. (1944). **The hormonal control of the oestrous cycle.**—*Vet. Rec.* **56.** 31–32. Discussion pp. 32–33. **149**

A discussion in which R. cites the chief milestones leading to the elucidation of the endocrine mechanism of the sexual cycle in mammals. The following specific points are dealt with in relation to the hormonal control of the oestrous cycle :– the initiation of the cycle; oestrogenic hormones, their methods of administration, esterification, and actions; the relation between the pituitary gland and the reproductive organs; the various gonadotropins and their several responses in the same test animal (*rat*); ovulation; and the corpus luteum hormone.—N. J. Scorgie.

Warwick, E. J., & Casida, L. E. (1943). **Effects of pituitary gonadotropins on estrual phenomena in ewes.**—*Endocrinology.* **33.** 169–173. **150**

Follicle-stimulating extracts of sheep pituitary gland administered subcutaneously and followed by luteinizing or unfractionated extracts given intravenously during the follicular phase of the oestrous cycle lengthened the oestrous period by an average of 0·76 day in 35 ewes. The increased length of the oestrous period occurred as a result of the ewes coming into oestrus earlier and remaining in oestrus until about the time when the oestrous period would normally have been expected to end. The lengths of time from the beginning of one oestrous period to the end of the next were approximately the same before and during treatment. Intra-ewe correlations for all inter-oestrous intervals previous to treatment showed that ewes tend to show a characteristic length in the inter-oestrous interval. This was found to be maintained during treatment. None of five ewes treated similarly during the luteal phase and only one of nine treated during anoestrus showed full oestrous behaviour following treatment; ovulation was, however, induced in all ewes of both these groups.

—N. J. Scorgie.

Halvorsen, K. (1944). **Vitamin E and progesterone. Influence of α-tocopherol acetate on the effect of progesterone by intrauterine and subcutaneous application in infantile rabbits.**—*Acta path. micro-*

biol. scand. **21.** 510–516. [In English]. [Author's summary copied *verbatim*]. **151**

The purpose of these experiments has been in infantile, estrin-treated rabbits to show whether Ephynal (α-tocopherol acetate) has any progesterone effect on the endometrium or potentializes the effect of progesterone on the endometrium. A total of 106 infantile rabbits were employed, each weighing 800–900 g., all receiving a preliminary treatment with 150 I.U. of estrin daily for 6 days. 46 rabbits were employed for a control curve, with intrauterine application respectively of 25 γ, 2·5 γ, 0·025 γ, and 0·0025 γ progesterone.

18 rabbits were employed for a control curve with subcutaneous application of 1 mg., ½ mg., and ¼ mg. progesterone.

10 rabbits were given a direct intrauterine application of Ephynal.

10 rabbits received an addition of 3 mg. Ephynal daily from the commencement of the preliminary treatment, and mean reaction doses of progesterone, by subcutaneous and intrauterine administration.

17 rabbits received an addition of 10 mg. Ephynal daily for 5 days simultaneously with subcutaneous application of progesterone.

5 rabbits were given a uterine injection of a solution containing both progesterone and Ephynal.

In no instance could any progesterone effect, direct or indirect, from Ephynal be demonstrated.

LIPPMAN, H. N., & SAUNDERS, J. B. DE C. M. (1944). **The nature of the hyperossification observed in the long bones of rats treated with excessive doses of oestradiol benzoate.**—*J. Endocrinol.* **3.** 370–383. **152**

It has been shown by various workers that long-continued dosage with large amounts of female sex hormones causes histological changes in the bones, the main feature of which is an increase in endosteal trabeculae (pigeon, chicken, rat, mouse, and g. pig). This article describes the effects on the bones of female rats of daily subcutaneous injections of 125 I.U. of oestradiol benzoate over a period of 1–6 weeks. The characteristic increase in trabeculae was observed and there was some decrease in size of the marrow cavity (femur). Although the percentage ash content of the bones increased under oestrogen dosage, the total ash content did not and it even showed some decrease after six weeks' treatment. The water and organic material in the bones decreased, and this is attributed to the general depressant effect of high oestrogen dosage on body growth, acting through the pituitary. Bone ossification, on the other hand, seems to be unimpaired and results in the smaller and more compact bones which are characteristic of oestrogen-treated animals. It is of interest that the Ca and P percentages and the Ca : P ratio in the bones is unaffected by high oestrogen dosage.—E. G. WHITE.

TURNER, C. W., IRWIN, M. R., & REINEKE, E. P. (1944). **Effect of feeding thyroactive iodocasein to Barred Rock cockerels.**—*Poult. Sci.* **23.** 242–246. **153**

Thyro-active iodocasein (protamone) having a potency of 3·1% of that of thyroxine, when incorporated in the food at a level of 0·1% caused cockerels to grow rather more slowly up to 12 weeks of age than did control birds. Feather growth was stimulated, but the deposition of subcutaneous fat was prevented. Thyroid weight was considerably depressed by protamone administration, but when this ceased, the weight frequently, but not invariably, returned to normal. Other glands were not affected.—E. M. CRUICKSHANK.

LEBLOND, C. P., GROSS, J., PEACOCK, W., & EVANS, R. D. (1944). **Metabolism of radio-iodine in the thyroids of rats exposed to high or low temperatures.**—*Amer. J. Physiol.* **140.** 671–676. **154**

When rats were exposed to different temperatures for various periods of time, it was found that during the two-hour period following injection of labelled iodine the thyroids of the animals exposed to cold (0°–2°C.) for 7 and 26 days fixed respectively 1·85 and 2·70 times as much radioactive I_2 as the thyroids of controls kept at 19°–25°C. The marked stimulation which extended from the 7th–26th day of exposure was absent after exposure to cold for 40 days. Eighteen or 30 hours after the injection of radioactive iodine, smaller amounts of labelled I_2 were found in the thyroids of the cold groups as compared with the controls. These results suggest an overall acceleration of thyroid metabolism in the cold with increased fixation of I_2 and turnover of thyroxine and more rapid excretion of iodized products.

Exposure of rats to heat (32°–34°C.) resulted in a decrease in I_2 fixation in the thyroid. This decrease in activity which could be observed as early as one day after exposure to heat and which persisted for at least 26 days, was slight.

Histological examination of the glands confirmed increase and decrease of activity respectively in the low- and high-temperature groups.—R. ALLCROFT.

AUERBACH, E., & DOLJANSKI, L. (1944). **The effect of cell growth-promoting tissue extracts on the healing of experimental cutaneous wounds in rats. I. Local application.**—*Brit. J. exp. Path.* **25.** 38–45. **155**

The authors found that saline extracts of adult chicken heart, and the alcohol precipitate of such an extract, have no influence on the rate of healing of cutaneous wounds in rats when applied locally in the form of powder, ointment (in a lanolin base), or as a fluid extract.

Saline extracts of seven-day-old chick embryos were also tried, with similar negative results. It is concluded that the growth-activating power of such extracts on tissue cultures *in vitro* does not hasten the phases of the wound-healing process *in vivo*.

—J. G. CAMPBELL.

NOER, R. J. (1943). **The blood vessels of the jejunum and ileum : a comparative study of man and certain laboratory animals.**—*Amer. J. Anat.* **73.** 293–334. **156**

In all the animals studied the distribution of arteries to the small intestine was found to be basically the same. From the great mesenteric trunk, intestinal arteries pass along the mesentery and form a series of arches. Smaller vessels—the so-called "vasa recta"—arise from these arches and pass to the intestinal wall where they are continued as mural trunks. These vessels form a lateral network along the intestinal wall and send branches round the intestine to the anti-mesenteric area to anastomose either directly or by ramification with the mural trunks of the opposite side. No significant difference was found in the levels at which mural vessels pierced the muscularis of the wall.

In man, the number of arches situated between the mesenteric trunk and the intestinal wall is considerable, especially in the ileum, and no anastomoses are found between the vasa recta. In the dog, however, and in many other species, only primary and secondary arches are present, the latter lying immediately adjacent to the intestinal wall. The very short vasa recta anastomose freely one with another.

These marked differences indicate that in experi-

mental work on the intestinal circulatory system, care must be taken in the choice of laboratory animals. The rabbit or opossum appears to be best suited for comparison with man. The arrangement in the sheep and goat is very similar to that in man, but the close association of the colon with the coils of the small intestine detracts from their value for this type of research. In the pig, a very different pattern is found; the only arches present are near the mesenteric root.

The text is illustrated by excellent photographs.
—C. W. OTTAWAY.

FREEMAN, L. W. (1942). **Lymphatic pathways from the intestine in the dog.**—*Anat. Rec.* **82.** 543–550. **157**

Experiments conducted on the lymphatic pathways from the intestine of the dog have revealed that in many cases chyle gains the venous system by means other than the left thoracic duct in the neck. Alternative pathways described include branching of the thoracic duct on the left side of the neck, ducts which send branches to the right side, ducts which anastomose with the main azygos vein, and ducts which send branches to the right side as well as forming an anastomosis with the azygos vein.

In experiments conducted to determine the total lymph transfer from the intestine to the bloodstream, these pathways must be considered; and it is suggested that cannulation of the thoracic duct within the thorax, as opposed to cannulation in the neck, would yield a more complete collection. Evidence produced indicates that these vessels are an integral part of the lymphatic system, and that they may function to ensure the normal transport of fat-laden lymph following the ingestion of a meal, at which time the flow is at its greatest.
—C. W. OTTAWAY.

*OTTAVIANI, G. (1942). Il sistema linfatico della cavia, Cavia Cobaya. [**The lymphatic system of the guinea pig**].—*Arch. Ist. biochim. ital.* pp. 3–28. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 520]. **158**

This is an account of the lymphatic system of the g. pig, and is intended as a guide for the use of laboratory workers in tracing the spread of lymph-borne infections.
—C. W. OTTAWAY.

ELIAS, H. (1944). **The oral cavity of domestic animals.**—*Middx Vet.* **4.** 18–22. **159**

An account is given of comparative histological features within the oral cavity of domestic animals. Many important differences are noted in this region. Among those described are the structure of the lips; the nature of the lingual papillae, particularly the foliate papillae of the horse, pig and dog; the lyssa of the carnivore tongue, and the hyoglossal apparatus of the chicken.—C. W. OTTAWAY.

COWGILL, E. J., & WINDLE, W. F. (1942). **Development of the cranial sympathetic ganglia in the cat.**—*J. comp. Neurol.* **77.** 619–630. **160**

Employing the pyridine silver method of staining, the authors were able to observe cells just beginning to extend processes toward the definitive sites of the new cranial sympathetic ganglia to be formed. Later, the cells appeared to slide along these processes to reach the ganglia. Observations showed that the ciliary ganglion is formed by neuroblasts migrating from the semilunar ganglion by way of the ophthalmic nerve. The spleno-palatine ganglion receives contributions from the semilunar ganglion along the maxillary nerve and from the geniculate ganglion along the great superficial petrosal nerve. The otic ganglion is formed by cells from the semilunar ganglion by way of the mandibular nerve, together with a few cells from the petrosal ganglion reaching it along the lesser superficial petrosal nerve. The submaxillary and sublingual ganglia receive neuroblasts via the lingual nerve from the semilunar ganglion. The lengths of the embryos in which these changes occur is given in each case.

The authors believe that if there are contributions from the neural tube to the cranial sympathetic ganglia they are made in some manner which leaves no histologic evidence by the staining method used. They also found that, although mesoderm cells appeared to differentiate into the connective tissue of the ganglia, there was no evidence of their being differentiated into neuroblasts.—H. V. HUGHES.

ROSE, J. E. (1942). **The thalamus of the sheep: cellular and fibrous structure and comparison with pig, rabbit and cat.**—*J. comp. Neurol.* **77.** 469–511. **161**

For purposes of description, R. divides the thalamus into three zones, *viz*, (a) epithalamus, including the habenular, the paraventricular and the pretectal nuclei; (b) the dorsal thalamus, with anterior, ventral, medial and dorso-lateral nuclear groups, the dorsal lateral geniculate and the medial geniculate bodies, and (c) the ventral thalamus including the reticular complex and the ventral lateral geniculate body. This classification is based upon R.'s ontogenetic findings in the diencephalon of the rabbit and is supported by experimental data and comparative anatomical facts. The possible homologies of all separated thalamic elements in the sheep, pig, rabbit, and cat are discussed and it is concluded that, in regard to the thalamus, the phylogenetic status of the sheep and pig is between rodents and carnivores. (The suprahypothalamic group is not described because, to be certain of its homology, it is necessary to have a knowledge of the nuclear configuration of the hypothalamus.) The sections, transverse, horizontal, and sagittal, were stained by the Weigert-Pal method or with thionin.—H. V. HUGHES.

—. (1944). **Annual review of biochemistry. Volume XIII.** [Edited by LUCK, J. M., & SMITH, J. H. C.] pp. ix+795. Stanford University P.O., Calif.: Annual Reviews Inc. [8vo]. [$5.00]. **162**

As almost every aspect of biochemistry can be applied to the problems of health and disease, it is difficult to single out a particular chapter in this volume as being of special interest to those concerned with animal health. The following table of contents indicates the scope of the present volume :– Biological Oxidations and Reductions by D. E. GREEN & P. K. STUMPF; Non-Oxidative Enzymes by T. MANN & C. LUTWAK-MANN; The Chemistry of the Carbohydrates by W. Z. HASSID; The Chemistry of the Lipids by J. B. BROWN; The Chemistry of the Proteins and Amino Acids by J. NEURATH & J. P. GREENSTEIN; The Chemistry and Metabolism of the Compounds of Phosphorus by A. A. GREEN and S. P. COLOWICK; Carbohydrate Metabolism by E. A. EVANS, Jr.; Fat Metabolism by R. H. BARNES & E. M. MACKAY; The Metabolism of Proteins and Amino Acids by C. P. BERG; The Steroids by F. C. Koch; The Biochemistry of the Nucleic Acids, Purines, & Pyrimidines by H. S. LORING; Mineral Metabolism by R. A. MCCANCE & E. M. WIDDOWSON; The Chemistry of the Hormones by H. JENSEN; The Water-Soluble Vitamins by J. C. KERESZTESY; The Fat-Soluble Vitamins by W. C. RUSSELL; Nutrition by W. H. SEBRELL; The Nutritional Deficiencies in Farm Mammals on Natural Feeds by C. F. HUFFMAN & C. W. DUNCAN; The Biochemistry of Malignant Tissue by D. BURK & R. J. WINZLER; The Alkaloids by R. H. F. MANSKE; Synthetic Drugs—Antispasmodics by F. F. BLICKE; Photoperiodism in Plants by K. C. HAMNER; Chloroplast Pigments by H. H. STRAIN;

Mineral Nutrition of Plants by F. J. Richards; Growth-Regulating Substances in Plants by J. van Overbeek; The Biochemistry of Fungi by E. L. Tatum; Histochemistry by D. Glick.

The section on the chemistry of the carbohydrates is confined to a review of important advances made during the last two or three years on the chemistry of the polysaccharides. In the last chapter which deals with histochemistry, a subject not previously reviewed in these volumes, the author has presented rather more than an "annual" review in order to give a more complete picture of this young and rapidly growing science. The veterinary reader may be interested to know that in the section on non-oxidative enzymes, a discussion is given on diffusing factors.—R. Allcroft.

See also absts. **217** (blood pressure determination in dogs), **118** (motile system of leucocytes), **186** (use of stilboestrol in cattle), **220** (artificial insemination), **226** (impotence in newly purchased bulls), **11** (influence of hypophysectomy on immunity), **240** (membrane permeability).

POISONS AND POISONING

Majumdar, B. N., Ray, S. N., & Sen, K. C. (1944). **Fluorine intoxication of cattle in India.**—*Indian J. vet. Sci.* **13.** 95–107. **163**

In normal cattle, the fluorine content of the blood (0·1–0·2 mg. per 100 ml.) was fairly constant for all ages, while that of bones (27–327 mg. per 100 g.) and of teeth (15–94 mg. per 100 g.) was proportional to the age of the animal. NaF, fed at the level of 6–8 mg. per kg. body weight, produced after six months, loss of weight, difficulty in movement, deformation of the hoof, and exostoses on the long bones. Similar symptoms had been reported from Madras and Hyderabad State in cattle. The blood, bones, and teeth of affected animals under both experimental and natural conditions contained a high concentration of F (blood 0·4 mg. per 100 ml., bones 500–1,100 mg. per 100 g., and teeth 93–195 mg. per 100 g.). Osteomalacia and aphosphorosis were ruled out, as the Ca and P of the blood, bones, and teeth of such animals showed normal values. The simultaneous addition of Ca salts mitigated the symptoms of fluorosis. Feeding one-tenth the above dose of F produced no symptoms within a year.

The distribution of possible fluorosis zones in India is illustrated.—S. N. Ray (India).

Smith, E. V. (1943). **The poisonous plant problem in the southeastern states.**—*N. Amer. Vet.* **24.** 345–353. **164**

It is stated that, whereas the menace of livestock poisoning from plants is well recognized in the western states of the U.S.A., it is largely overlooked in the southeastern region. Cases of false diagnosis are cited, and notes are provided in tabular form of the symptoms and lesions attributable to poisoning by 29 different plants. Of special interest is the reference to Dallis grass (*Paspalum dilatatum*), recognized as a good pasture grass yet often dangerous to cattle due, it is stated, to fungous infection. The "ergot disease" of Dallis grass differs from that due to ergot of rye [see Brown & Rank (1915). "Forage poisoning due to *Claviceps paspali* on Paspalum." *Tech. Bull. Mo. agric. exp. Sta.* No. 6].—A. N. Worden.

*Södermark, N. (1942). Frangulaförgiftning hos nöt. [*Rhamnus frangula* **poisoning in a cow**].—*Svensk. VetTidskr.* p. 27. [Abst. from abst. in *Skand. VetTidskr.* **32.** 458]. **165**

In a case of poisoning of a cow at pasture, eventually diagnosed as due to ingestion of *R. frangula*, the symptoms were diarrhoea, cramps, moderate fever, and death after a few hours. Treatment with charcoal, chalk, and linseed mucilage was without effect. The only P.M. change was slight gastro-enteritis. A large quantity of seeds of *R. frangula* was found in the stomachs.—J. E.

Handler, P., & Baker, R. D. (1944). **The toxicity of orally administered tannic acid.**—*Science.* **99.** 393. **166**

There was no histological evidence of hepatic damage in rats killed after 90 days on diets containing 1% and 2% tannic acid. Growth was not as good in the groups receiving tannic acid as in control groups, but this appeared to be due to the animals' dislike for the diet. These results indicate that the gastro-intestinal tract is impermeable to tannic acid since some of the animals ingested 100 times the amount of tannic acid which, given subcutaneously, invariably produced hepatic necrosis.—R. Allcroft.

Chiesman, W. E. (1944). **Diagnosis and treatment of lesions due to vesicants.**—*Brit. med. J.* July 22nd. 109–112. **167**

A restatement of the effects of mustard and lewisite "gases" on the human body and subsequent treatment.

The action of mustard "gas" is delayed, whereas the effects of lewisite are more or less immediate. If there is no effect when liquid "gas" enters the eye, it may be assumed that the agent is mustard "gas" and the eye should immediately be profusely irrigated to remove contamination. The effect of lewisite on the eyes is immediate and, owing to extreme pain, irrigation is difficult and almost useless. B.A.L. ointment (which is controlled by the Emergency Medical Service and is not generally available) is a specific for arsenical vesicants and will ensure a complete cure provided that it is applied within 2 min., but beneficial results may, in some cases, be secured up to an hour after contamination. Whatever agent is responsible, constantly repeated irrigation is detrimental. Protection from light is desirable but antiseptics, analgesics, and bandaging of the eyes are contra-indicated. In bad cases dilation of pupil by mydriatics is desirable. Sulphacetamide drops relieve and combat infection.

When skin is actually damaged the use of prophylactic ointment is inadvisable, but B.A.L. is of considerable value at this stage. Blisters should be left intact and sterile oily dressings applied. Sulphonamides are useful to counteract infection. Dressings should be changed only when absolutely necessary.

There is no specific treatment for alimentary symptoms, but coughing may be controlled by codeine and inhalations of tinct. benzoini co.—H. E. Bywater.

See also absts. **98** (tick paralysis), **199** (food poisoning).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

Waksman, S. A., & Geiger, W. B. (1944). **The nature of the antibiotic substances produced by *Aspergillus fumigatus*.**—*J. Bact.* **47.** 391–397. **168**

A. fumigatus produces the antibiotic substances fumigacin, fumigatin, gliotoxin, and (some strains) spinulosin. Fumigacin was first thought to contain sulphur and nitrogen [see Waksman *et al.*—*V. B.* **13.** 226, and **14.** 210.], but their presence subsequently proved to be due to gliotoxin [see Menzel *et al.*—*V. B.* **14.** 430.], the yield of the latter in the fumigacin

fraction being increased by more direct alkaline extraction methods. W. confirms the findings of MENZEL *et al.* and characterizes the activity of the antibiotics produced. Most active is gliotoxin, inhibiting growth in a greater number of bacterial species, including some Gram-negative organisms, than fumigatin and fumigacin ; of the latter, fumigacin is the more active. Gliotoxin is, however, more toxic to animals than is fumigacin, which offers more promise as a chemotherapeutic agent. The so-called " helvolic acid " of British workers appears to be identical with fumigacin.—A. B. P.

I. VON LUSTIG-LENDVA, E. (1944). **Preliminary clinical report on vivicillin.**—*Vet. Rec.* **56.** 178–179. **169**

II. CRAWFORD, T., HANDLEY, R. S., & HARGREAVES, W. H. (1944). **Clinical trial of a penicillium preparation. [Correspondence].**—*Lancet.* **246.** 738–739. **170**

I. A report of clinical tests of " pennotin " and " vivicillin " in small animal veterinary practice. These are described as standardized antibacterial pyrogen-free metabolic preparations containing living *Penicillium notatum.* " Pennotin " is for external application and " vivicillin " for internal use.

About 100 cases have been treated with " vivicillin ", mostly feverish conditions of known and unknown aetiology in dogs. It was injected intramuscularly at a dosage level of 1 ml. per 20 lb. body weight. Some pain was generally caused by the injection, and in a number of cases the reaction was violent. Usually a decrease in temperature occurred within a few hours, and it is claimed that in the majority of cases 2–3 injections were sufficient to effect a cure. It is also claimed that the drug has a specific action on organisms of the *coli* group. In streptococcal infections, its action was highly satisfactory.

" Pennotin " applied on gauze was tested on 12 wound cases ; seven responded favourably, two infected with anaerobes derived no benefit, and the value in the remaining three was doubtful.

II. An account is given of trials of vivicillin in the human subject.

Intramuscular injections of 12–20 ml. of the substance daily for 3–5 days were given to patients with indolent ulcers, recurrent boils and carbuncles, chronic ulcerative colitis, subacute bacterial endocarditis, gonococcal cervicitis, and chronic staphylococcal septicaemia. In some instances local applications were also made.

In no case could it be demonstrated that vivicillin had any bacteriostatic or therapeutic effect, although all streptococci, staphylococci, and gonococci isolated from the cases proved to be penicillin-sensitive.

The serum of patients treated with vivicillin was tested on 12 occasions by the slide-cell technique. On no occasion was any bacteriostatic power detected, even in the undiluted serum.—D. D. OGILVIE.

KUHN, R., MÖLLER, E. F., & WENDT, G. (1943). Ueber 4,4′-Diaminobenzil und seine Einwirkung auf Bakterien. **[4,4′-Diaminobenzil and its action on bacteria].**—*Ber. dtsch. chem. Ges.* **76.** 405–412. **171**

The drug, which is interesting in that it contains no sulphur, is 2–4 times as active as sulphanilamide and diaminodiphenyl sulphone against staphylococci, but less active than sulphathiazole against these organisms. Against lactic acid bacteria, diaminobenzil is as active as sulphathiazole. The effect of the drug is inhibited by *p*-aminobenzoic acid.—J. M. ROBSON.

HENRY, R. J. (1943). **The mode of action of sulfonamides.**—*Bact. Rev.* **7.** 175–262. **172**

Although the sulphonamides are generally bacteriostatic rather than bactericidal, they may have bactericidal action if present in high concentration or in combination with other unfavourable environmental conditions. Sulphonamides inhibit the growth of many species of bacteria and also of some few viruses, protozoa, plants, and luminescent organisms. Low concentrations of sulphanilamide may stimulate growth. Maximal inhibition is generally obtained at such a pH that the drug is half ionized. The inhibitory effect increases with rise of temperature. The active compounds usually contain an amino group attached to a benzene ring in the *p* position to a sulphur atom.

The synergistic action of sulphonamides and antibodies and the theories of action depending on conversion to hydroxylaminobenzene sulphonamide which might inhibit catalase or poise the oxidation-reduction potential are discussed. The generally accepted hypothesis of the mechanism of sulphonamide inhibition is that it interferes with metabolism of *p*-aminobenzoic acid. The *p*-aminobenzoic acid is presumably essential for the nutrition of organisms affected by sulphonamides. Sulphonamide action is also antagonized by amino acids—particularly methionine—by purines, urethane, and by unknown substances present in serum and peptone. Sulphonamides inhibit the respiration of some bacteria, and it has been suggested that sulphanilamide antagonizes the processes involving coenzymes. It is suggested that the inhibition of metabolism is non-specific and similar to the action of narcotics.—E. B.

MCLEOD, J. W., MAYR-HARTING, A., & WALKER, N. (1944). **Observations on the bactericidal and bacteriostatic actions of *p*-aminobenzenesulphonamide and *p*-hydroxylaminobenzenesulphonamide, with special reference to their suppression by *p*-aminobenzoic acid.**—*Brit. J. exp. Path.* **25.** 27–37. **173**

Experiments with a number of organisms show that the capacity of *p*-aminobenzoic acid to neutralize sulphanilamide bacteriostasis decreases in proportion to the *in vitro* sensitiveness to sulphanilamide of the bacterium under examination. It must be assumed, on the basis of the Woods and Fildes theory of substrate competition, that, in the case of some strains of meningococcus which are very sensitive to sulphanilamide, the hypothetical enzyme which combines with *p*-aminobenzoic acid shows an even greater affinity for sulphanilamide. In confirmation of the observation of GREEN & BIELSCHOWSKY (1942), it was found that the effect of *p*-hydroxylaminobenzene sulphonamide on *Bacterium coli* is only slightly reversed by *p*-aminobenzoic acid. In the case of other bacteria, however, a more marked reversal of this type does occur if the organisms are grown exposed to air at a surface.—J. M. ROBSON.

HIRSCH, J. (1944). **The velocities of inhibition of bacterial growth by sulfonamide and of the antagonistic effect by *p*-aminobenzoic acid.**—*J. Immunol.* **48.** 199–201. **174**

The inhibiting effect of a sulphonamide, N_1-3,4-dimethylbenzoylsulphanilamide, on the growth of *Staphylococcus aureus* has a lag period of 1–2 hours ; in contrast, its bacteriostatic effect is instantly antagonized by the addition of *p*-aminobenzoic acid. H. concludes that the bacteriostatic—anti-bacteriostatic effect of these substances must take place via a complex mechanism, and cannot be considered as a reversible equivalent process.—ALEX B. PATERSON.

BRYAN, A. H. (1944). **Some clinical experiences with sulfapyridine in small animal practice.**—*J. Amer. vet. med. Ass.* **114.** 288–290. **175**

Clinical experiences with sulphapyridine in a large number of cases in small animal practice are described. Best results followed its use in canine and feline dis-

temper, in puerperal sepsis, in mastitis, and in local infections. The drug was also effective when employed locally in wounds and in the peritoneal cavity.
—D. D. Ogilvie.

Middlebrook, G., & Lloyd, J. B. (1944). **Effects of pH, temperature and salicylate on bacteriostasis of tubercle bacilli by sulfonamides and diaminodiphenylsulfone.**—*Amer. Rev. Tuberc.* **49.** 535–538. [Spanish summary]. **176**

The bacteriostatic effects of these drugs on an H 37 strain of tubercle bacilli were investigated in Sauton's medium. The activity of sulphathiazole and diaminodiphenyl sulphone increases with an increase in pH from 5·5 to 8·5, while sulphadiazine seems to be more active at the lower pH. A rise of incubation temperature from 37°C. to 39°C. does not increase the inhibitory effects of sulphathiazole and diaminodiphenyl sulphone. Salicylic acid and diaminodiphenyl sulphone appear to be additive in their bacteriostatic effects on the strain tested.—J. M. Robson.

Lloyd, J. B., & Middlebrook, G. (1944). **Bacteriostatic activity of some new derivatives of diaminodiphenylsulfone and naphthoquinones against the tubercle bacillus.**—*Amer. Rev. Tuberc.* **49.** 539–542. [Spanish summary]. **177**

N,N′ - distearoyl - diaminodiphenylsulphone and N,N′-dichaulmoogroyl-diaminodiphenylsulphone did not inhibit one strain of tubercle bacillus tested in suitable suspension in solid Saunton's medium. Of 15 naphthoquinone compounds tested *in vitro*, only 3-sulphanilyl-1,4 naphthoquinone showed sufficient promise for further investigation.—J. M. Robson.

*Urso, B. (1941). Azione dei solfamido-tiazolici nella Castellanosi sperimentale. [**Action of sulphathiazole on experimental trypanosomiasis** (*T. equiperdum*)].—*Arch. ital. Sci. med. colon.* **22.** 449–456. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **142.** 463]. **178**

Sulphathiazole administered either orally or intramuscularly to g. pigs or to rats infected with *T. equiperdum* appeared to have no influence on the course of the infection, even when given in the early stages of the disease.—U. F. Richardson.

Eagle, H., Magnusson, H. J., & Musselman, A. D. (1944). **The therapeutic efficacy of penicillin in relapsing fever infections in mice and rats.**—*Publ. Hlth Rep., Wash.* **59.** 583–588. [Authors' summary copied *verbatim*]. **179**

The total dosages of penicillin which "cured" 50 percent of white rats and mice infected with *Borrelia novyi* were 130,000 units and 100,000 units per kilogram, respectively. Approximately 400,000 units per kilogram were necessary to cure more than 95 percent of the animals. This was half the dose which killed a significant proportion of the rats.

If these results can be translated to man, they imply that the curative dose of penicillin in man would be on the order of 25,000,000 units. Unless relapsing fever is more amenable to treatment in man than it is in these experimental animals, or unless other strains of the organism prove more susceptible to penicillin, the therapeutic use of the drug would not appear warranted except in arsenic-resistant cases, at least until such time as it is available in larger quantities.

*Barke, A. (1942). Eubasin und Tibatin bei der Staupebehandlung des Hundes. [**Treatment of distemper in dogs with "eubasin" (sulphapyridine) and "tibatin"**].—*Dtsch. tierärztl. Wschr.* pp. 245–248. [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 354]. **180**

The early use of sulphapyridine is said to give good results in the treatment of distemper. On account of its greater compatibility, "tibatin" is useful for earlier and more repeated administration to prevent an outbreak of distemper-pneumonia. Compared with other sulphonamides, "tibatin" is followed by fewer relapses, particularly those with nervous symptoms.
—U. F. Richardson.

*Marchal, Guérin, M., & Guérin, P. (1941). Essais de divers produits synthétiques sur la leucémie transmissible de la poule. [**Effect of various synthetic therapeutic products on avian leucosis**].—*C. R. Soc. Biol. Paris.* **135.** 1410–1412. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 249]. **181**

The effect was investigated of daily intravenous injections of subtoxic doses of a number of synthetic chemicals on the course of avian leucosis in hens infected with Engelbreth-Holm or OG strains. Bases 728, 730, 692, and 852, derivatives of rhodoquine obtained by altering the side chain, gave results (ten birds cured out of 27 treated) which were much less favourable than those obtained by Oberling & Guérin with rhodoquine. Results were no more favourable with the acridine derivative, atebrin, and the author also found sulphanilamide and soluseptasine to be completely inactive against the virus.—J. Lochiel McGirr.

Yeager, J. F., & Wilson, C. S. (1944). **Circa 42, a new itch remedy.**—*J. Lab. clin. Med.* **29.** 177–178. **182**

This contains *n*-butyl-*p*-aminobenzoate and benzyl alcohol made up with anhydrous lanolin, corn starch, and sodium lauryl sulphonate (a detergent). Promising results were obtained in various insect bites; the itching was usually relieved quickly and for a long period.
—J. M. Robson.

Martini, I. (1942). Moderni aspetti della terapia delle principali dermopatie dei nostri animali domestici. [**Modern treatment of the principal skin diseases of domestic animals**].—*Progr. Zooiatr.* **10.** 25–34. **183**

A short review of the pathogenesis of the more important skin diseases of domestic animals, together with methods of treatment. No new material is presented.—Isobel W. Brocklehurst.

Daft, F. S., & Sebrell, W. H. (1943). **The successful treatment of granulocytopenia and leukopenia in rats with crystalline folic acid.**—*Publ. Hlth Rep., Wash.* **58.** 1542–1545. **184**

The production of granulocytopenia and leucopenia in rats by the feeding of sulphonamides and treatment of the conditions by liver extracts, has lately received attention.

Recently, folic acid, a liver derivative, has been isolated in crystalline form and has been identified as a member of the vitamin B complex and as an anti-anaemia factor for chickens. Folic acid was tested for activity in correcting blood changes in rats fed sulphaguanidine and sulphasuxidine in purified diets. Seven animals showed complete recovery over a ten-day period; in two other animals, however, results were negative. It is concluded that crystalline folic acid is sufficiently active as an anti-anaemic agent in this condition to merit extensive trial.—D. D. Ogilvie.

*Pierrot, F. G. (1943). De la non délivrance chez la vache; son traitement par les injections huileuses intra-utérines. [**Uterine inertia in the cow. Treatment with uterine injections of oil**].—*Thesis, Alfort.* [Abst. from abst. in *Rec. Méd. vét.* **119.** 110]. **185**

P. objects to the use of intra-uterine injections of aqueous antiseptics because of their irritant action on the mucosa. He uses uterine injections either of an oil alone or of a simple oil (½ litre) to which has been added oil of guaiacum (45 g.). The oil, warmed to 36°C., is

run slowly into the uterus under gravity; epidural anaesthesia gives the necessary quiescence to the uterus for the long retention of the oil. The oil is said to favour involution of the uterus, to prevent putrefaction, and to act as an emollient by virtue of its fatty acid content. P. has successfully treated 100 cases of retained placenta with injections of oil.—N. J. SCORGIE.

GLENNEY, W. C. (1944). **Stilbestrol in dairy practice.**—*N. Amer. Vet.* **25.** 91–96. **186**

Doses of 20–40 mg. stilboestrol given orally or by subcutaneous injection had little or no beneficial effect in causing involution of the uterus and separation of the membranes in a large number of cases of retained placenta in cows; details of 13 case histories are given. In a further five cases, two injections of 30 mg. each, the first given 3–4 days after calving and the second at a further interval of 3–4 days, were also ineffective. In the treatment of pyometra, stilboestrol was apparently of some value, but in no case was it sufficient to clear up the condition without other methods of treatment. Nineteen case histories of "suspended oestrus" are described, from which it is evident that the effects of stilboestrol were variable. [Unfortunately no information is given as to the state of the ovaries in these cases at the time of treatment.] In one case of mummified foetus, 20 mg. of stilboestrol [route of administration not stated] failed to remove the foetus.—N. J. SCORGIE.

*ZEETTI, R. (1942). Ricerche sull'azione degli ossicloruri elettrolotici nelle lesioni podali del'afta sperimentale. [**Action of an electrolytic oxychloride on foot lesions of foot and mouth disease**].—*Azione vet.* **11.** 286–293. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 127]. **187**

The healing properties of the electrolytic oxychloride "amuchina Z" were compared with those of sodium chloride, sodium carbonate, copper sulphate, and creolin in treating the foot lesions of F. & M. disease in g. pigs. Healing was quickest in those lesions dressed with "amuchina Z", being complete 4–6 days sooner than with sodium chloride, 3–5 days sooner than with sodium carbonate, and 2–4 days sooner than with copper sulphate or creolin.—W. M. HENDERSON.

POATE, H. R. G. (1944). **Acridines in septic wounds. Use of 5-aminoacridine.**—*Lancet.* **247.** 238–240. **188**

The trial of 5-aminoacridine and 2 : 7-diaminoacridine in 120 cases, including 24 suppurating gunshot wounds of bone, gave very good results. In all but five cases, sepsis was immediately controlled. For general use in wards P. prefers 5-aminoacridine, because it does not stain fabrics and tissues. Where there is gross established sepsis, the wound may be irrigated with a 1 : 1,000 aqueous solution of 5-aminoacridine through Carrel tubes. For other purposes an emulsion may be made, or the acridine, in powder form, may be mixed with sulphanilamide (1 : 10–1 : 40). Recent wounds associated with compound fractures have been treated with this powder after débridement and then closed by primary suture. Acriflavine should no longer be used and the acidity of proflavine sulphate B.P. should be corrected before it is applied.—J. M. ROBSON.

BONNEY, V., & ALLEN, H. S. (1944). **Sterilization of the skin by colourless flavine (5-amino-acridine).**—*Brit. med. J.* August 12th. 210–211. **189**

A 1% solution of 5-aminoacridine in equal parts of rectified spirit and water was used to sterilize the skin in 38 cases of abdominal operations. Bacteriological tests were made and the results were considered satisfactory.—J. M. ROBSON.

BROWNLEE, G., TONKIN, I. M., & KENNEDY, C. R. (1943). **Acridine powder in wound therapy.**—*Quart. J. Pharm.* **16.** 73–78. **190**

Three acridine bases, 5-aminoacridine, 2 : 7-diaminoacridine, and 2 : 8-diaminoacridine (proflavine) and their corresponding salts are potential chemotherapeutic wound dressings. The free bases are most suitable for this purpose since the resulting serum concentrations are the same whether salts or bases are used (with the exception of 2 : 7-diaminoacridine base with which the serum concentration is much lower than with its hydrochloride). Disadvantages, *i.e.* irritation and damage to leucocytes, occur with the usual acid salts of the bases, by reason of excessive solubility and acid buffering effect. Estimates of bactericidal potency with a typical wound pathogen, *Staphylococcus aureus*, suggest the use of 2 : 8-diaminoacridine base which is also least toxic to leucocytes.—J. M. ROBSON.

SCHREUS. (1943). Felderfahrungen über die Chemotherapie der Anaërobenwundinfektion insbesondere mit Globucid nebst Bemerkungen über Chemoprophylaxe. [**Field experiences in the chemotherapy of anaerobic infections of wounds, especially with globucid, together with remarks on chemoprophylaxis**].—*Dtsch. med. Wschr.* **69.** 73–76 & 101–104. **191**

Extensive observations were made on the treatment of cases of gas gangrene with sulphonamides, with and without serum. The main sulphonamides discussed are sulphacid (4-amino-4′-ureido-diphenyl sulphone), prontosil, marfanil (4-amino methyl benzene sulphonamide), sulphathiazole, and globucid (sulphanilamido-ethyl-thiodiazole). They can be given either orally or locally or by both methods. S. stresses the value of globucid which, under experimental conditions, has given excellent results even without excision and without serum treatment. He suggests that soldiers in the field should have available in their kit a supply of this drug, which should be taken immediately after injury in order to give the optimum effect. Thorough surgical cleansing of the wound should be carried out as early as possible, and treatment with the sulphonamide, both local and oral, and with serum should then follow. If oral administration is impossible, globucid should be injected intravenously at six-hourly intervals.—J. M. ROBSON.

DE WAAL, H. L. (1943). **Wound infection. A preliminary note on a combined clinical and bacteriological investigation of 708 wounds.**—*Edinb. med. J.* **50.** 577–588. **192**

The object of this work was to study, by repeated examinations, the bacteriological flora of wounds from the time of admission of the cases to hospital until the completion of healing, and to correlate this with the effects of various forms of treatment. The substances used were sulphanilamide, sulphapyridine powder, sulphacetamide (albucid paste), acriflavine, gentian violet, brilliant green, eusol, zinc peroxide, iso- and hypertonic saline, tannic acid, and silver nitrate.

Due to the many variable factors, it was impossible to assess accurately the therapeutic value of the various substances used. It was found, however, that wounds treated with acriflavine and gentian violet healed least rapidly, whilst with all the other substances the rate of healing was approximately the same. Repeated moist dressings with acriflavine 1 : 1,000 rendered many wounds sterile in 3–5 days, even when pus and necrotic tissue were present, and from this point of view acriflavine was found to be superior to the sulphonamides.—J. E. LANCASTER.

FISHER, C. V., ACCOUSTI, N. J., & THOMPSON, M. R. (1943). **Bacterial contaminations in sulfonamide ointments.**—*J. Amer. med. Ass.* **122.** 855–858. **193**

5% sulphanilamide, sulphathiazole, or sulphadia-

zine ointments in a water-dispersible base may become contaminated with disease-producing organisms (haemolytic streptococci, *Bacterium coli*, clostridia) which these sulphonamides are then not capable of killing. The addition of small amounts of other chemicals, especially certain oxidizing agents, markedly increases the self-sterilizing properties of these ointments. The most practical and generally effective agent seems to be urea peroxide, which should not be used in concentrations higher than 1% in order to avoid irritation.—J. M. R.

See also absts. **238** (wartime standards for drugs), **71** (theory of enzyme treatment of bacterial disease), **226** (treatment of bovine piroplasmosis), **143** (of colonic stasis), **144** (of sterility in horses and cattle), **167** (of lesions due to vesicants), **33** (effect of hard water on disinfectants).

HYGIENE AND PUBLIC HEALTH

MORRIS, C. S. (1944). **Effect of temperature on the reducing activity of leucocytes in milk. [Correspondence].**—*Nature, Lond.* **153.** 436. **194**

Investigations were carried out to determine whether milk from cows with mastitis had an increased reducing power due to the presence of the large numbers of leucocytes, thereby failing to pass the resazurin test. Milk with high leucocyte counts was subjected to the test immediately after production and after holding at different temperatures overnight. Milk held at 55°F. did not reduce resazurin as rapidly as when tested immediately after production, the reason given being that leucocyte metabolism in milk is catabolic and not anabolic, and that the life of the leucocyte is dependent upon the temperature at which the milk is held. M. confirms that milk with a high leucocyte content reduces resazurin less rapidly after being held at body temperature than before this, whereas such milk held at lower temperatures gives the same reaction to the resazurin test before and after holding.—J. M. PETERS.

GAUTHIER, J., & FOLEY, A. R. (1943). **A cheese-borne epidemic of typhoid fever.**—*Canad. J. publ. Hlth.* **34.** 543–556. **195**

An outbreak of typhoid fever in the county of Champlain, Quebec, is described; 40 cases were registered with six deaths. The authors believe that massive infection must have taken place. Cheese was the food incriminated and further investigations led to the discovery that a known typhoid carrier had milked cows against the authors' orders and that the milk was sold to the cheese factory involved. This carrier had had typhoid fever 20 years previously and may well have been the cause of small outbreaks in the district in 1931, 1932 and 1934. It is advocated that cheese should be matured for a period of three months before its release for consumption.—J. L. BYRNE (CANADA).

THORNTON, H. (1943). **Practical aspects of meat inspection.**—*Vet. Rec.* 55. 469–470. Discussion pp. 470–471. **196**

Stressing the need for care in the inspection of carcasses from animals killed as an emergency measure, T. briefly discussed the more common conditions which necessitate emergency slaughter and outlined the measures to be adopted when animals have to be slaughtered on the farm and the carcass bled and eviscerated in preparation for subsequent dressing.

Dystokia cases should be dealt with promptly and bled and eviscerated if the carcasses are to be salvaged. Cases of septic mastitis and septic metritis are definitely a source of danger and should be sent to the knackery.

Offensive odours result from choking by turnips—often to such a degree as to warrant rejection of the carcass. Ether, turpentine, carbolic acid, and spirit of nitrous ether can be detected in the carcass and it is also inadvisable to give aloes, magnesium sulphate, and chloral hydrate prior to slaughter.

If the diagnosis and slaughter of cases of Johne's disease is too long delayed, total condemnation may result, but poorness alone does not invariably render the flesh unfit.

Actinomycosis involving the facial bones is much less common than actinobacillosis involving the muscles and/or tongue (the ratio is 1 : 10).

T. dealt with TB. at some length, referring to the method of infection and spread in the body, and concluded by saying that the war offered a unique opportunity to improve methods both in the meat trade and the meat inspection service.

In the course of discussion on the paper, DIXON said that Johne's disease is being increasingly encountered in the abattoir. He stressed the need for careful and experienced judgment in the case of carcasses slaughtered in emergency and deplored the official sanction for abattoir managers to pass such carcasses as a matter of expediency. He was concerned that the Ministry of Food tended to favour relaxation of the standards of meat inspection. He urged all inspectors to follow literally the Ministry of Health recommendations. Actinomycosis of the udder, contrary to statements made in most text-books, is exceedingly rare.

GUTHRIE pointed out that *ante-mortem* temperature was not always a reliable guide to the quality of the meat. Lambs killed while affected with pulpy kidney disease dressed and set well.—H. E. BYWATER.

DE FAGONDE, A. P., & BODNER, M. (1943). Contribución al estudio de la preparación de los sueros precipitantes de alto titulo para el diagnóstico de las carnes embutidas. **[Preparation of high-titre precipitating sera for the determination of the animal of origin of meat products].**—*Bol. tec. Direcc. gen. Agric. Ganad., B. Aires.* Secc. ganad. No. 8. pp. 485–496. **197**

High-titre precipitating sera were prepared by inoculating large healthy rabbits either subcutaneously or intravenously with animal serum. Two inoculations at intervals of one or two months were found to give best results, and none of the rabbits died from shock.—ISOBEL W. BROCKLEHURST.

WILLSON, R. F. (1943). **Poultry inspection in the city of Detroit.**—*J. Amer. vet. med. Ass.* **103.** 364–366. **198**

An ordinance of the City Council passed in 1936 renders it unlawful for any poultry dealer to deal in, offer for sale, sell or purchase, or deliver in the city live or dressed poultry unless such poultry has been inspected by the Board of Health at one of two central concentration points in the city. The ordinance defines approved poultry. The poultry division of the Health Department is under the supervision of a veterinarian with seven lay inspectors, three of whom are inspectors of live poultry and one of dressed poultry, while the remainder inspect retail stores and customs abattoirs. In 1942, 607,812 coops of chickens and over 12 million lb. of dressed poultry were inspected. 270,505 lb. of poultry were condemned, chiefly owing to emaciation in the live bird and spoilage in dressed birds. TB. was the second, and the leucosis syndrome the third, main cause of condemnation.—H. V. H.

—. (1943). Merkblatt über die bakterielle Lebensmittelvergiftung (Botulismus). Neubearbeitet im Reichsgesundbeitsamt. **[Germany: notice on bac-**

terial food poisoning (botulism)].—*Reichsgesundheitsblatt.* **18.** 274–280. **199**

This article is written in the form of an advisory leaflet for general distribution amongst those who handle food, and intelligent members of the public. It is very comprehensive, but includes many elementary details with which scientists and trained officials would be thoroughly familiar.

The main type of food poisoning considered is botulism, but other forms due to paratyphoid organisms and the products of putrefaction are also discussed. In 1941, 2,083 cases of botulism were recorded in the Reich and 172 in the occupied territories of eastern Europe, with a mortality of about 3%.

The means of spread of the organisms of this class are considered, special reference being made to the importance of and the means to be taken to prevent spread by infected persons, in the case of the organisms so disseminated. Reference is made to inspection of buildings, control of personnel and vermin, etc.

—N. S. Barron.

Bradley, W. H. (1943). **An endemiological study of Bact. typhosum type d4.**—*Brit. med. J.* April 10th. 438–441. **200**

A series of cases of enteric fever, all found to be due to a recently described type d4 strain of *Salmonella typhi* [see Felix—*V. B.* **14.** 92.], were investigated. A persistent carrier of *S. typhi* was a worker on a farm, the milk from which was presumably responsible, not for the usual explosive outbreak, but for a series of seemingly sporadic cases, some single and others occurring in small groups, which were scattered throughout a wide area over a period of two years.

The series included, with only one exception, all the type d4 cases recorded in England and Wales during 1941 and 1942.—H. E. Bywater.

See also absts. **228-232** (milk control in England), **27, 28** (origin of undulant fever).

TECHNIQUE AND APPARATUS

Walker, A. W., & Day, A. A. (1943). **Extracts from Irish moss as a substitute for agar in bacteriological culture media.**—*Food. Res.* **8.** 435–443. [Abst. in *J. Dairy Sci.* **27.** A 31, copied *verbatim.* Signed: F. J. D.] **201**

The possibility of using the gelatinous extract of *Chondrus crispus* (Irish Moss) as a substitute for agar, which is becoming a "critical material", was investigated. The particular product used was "carrageen" made by the Krim-Ko Co. of Chicago, Illinois, to which the manufacturers have given the name "Carragar" when used as a substitute for agar.

Results indicated that "Carragar" can be used as a solidifying agent in bacteriological culture media. The gel is not as firm as agar, the melting point is lower and it is more easily hydrolyzed. However, it is satisfactory for most purposes and can be made firmer by additions of agar to it. Neutralization of the "Carragar" before heating prevents its hydrolyzation.

"Carragar" produced comparable results, in all of the media employed in the study, to those obtained with agar.

Rose, S. B. (1942). **The importance of CO_2 in diagnostic bacteriology with observations on a CO_2 (capneic) incubator.**—*Amer. J. clin. Path.* **12.** 424–433. **202**

It is generally recognized that most bacteria require CO_2 for growth. R.'s experiments indicated that the requirement is a variable one. Using an incubator especially adapted to maintain a CO_2 concentration of 3%, he found that the meningococcus, pneumococcus, *Streptococcus haemolyticus* and *Bact. friedländeri* are much more easily isolated and identified than when the ordinary incubator is used, and that they can be regarded as CO_2-sensitive organisms. On the other hand, *Staphylococcus aureus* and *Bacterium coli* appeared to be insensitive to a CO_2 environment, although their growth was not inhibited by the presence of the gas. The deciding factor appeared to be the relative CO_2 production by metabolism of the organisms concerned, *e.g. Staph. aureus* produces CO_2 at a rate adequate to ensure growth, while the pneumococcus and others multiply and form colonies only after prolonged incubation or if CO_2 is artificially provided, the lag phase then being shortened. Fastidious organisms, however, may fail to survive this lag phase. It is suggested that the use of such a CO_2-incubator in diagnostic clinical laboratories would yield a significantly higher incidence of positive results.—H. I. Field.

Stokes, J. L., Gunness, M., & Foster, J. W. (1944). **Vitamin content of ingredients of microbiological culture media.**—*J. Bact.* **47.** 293–299. **203**

Forty-six samples of the complex organic nitrogenous substances commonly used in culture media were assayed for their content of eight members of the vitamin B-complex (thiamine, riboflavin, pantothenic acid, nicotinic acid, biotin, pyridoxine, folic acid, and *p*-aminobenzoic acid) and the values obtained were compared with the amounts recorded as required for the optimum growth of 24 micro-organisms.

The results, presented in tabular form, indicated that media made from peptones, meat extracts, etc., in concentrations of 1–2% might be deficient in thiamine, riboflavin, pantothenic acid, pyridoxine, and *p*-aminobenzoic acid, but not in nicotinic acid, biotin, or folic acid. It is suggested that growth-factor deficiencies in culture media may be remedied by proper combination of the different ingredients or by the addition of liver or yeast concentrates or of synthetic vitamins. A rough classification of the media ingredients in descending order of abundancy of B vitamins is given as follows:– (a) yeast extract (yeast extract manufactured by a now obsolete progress was low in all eight vitamins); (b) meat extract, brain heart infusion, and heart infusion; (c) neopeptone, proteose-peptone, tryptose, malt extract, and malt extract broth, and (d) peptone, special peptone, and tryptone.—J. Lochiel McGirr.

Boquet, A. (1943). Sur la culture du bacille tuberculeux bovin. **[Cultivation of the bovine type of tubercle bacillus].**—*C. R. Soc. Biol. Paris.* **137.** 687. **204**

Tissue or caseous material is pounded in a mortar, and 4% sodium hydroxide solution is added; the mixture is allowed to stand for 30 min.; it is then made into a fine suspension in normal saline and inoculated immediately on to Löwenstein's medium.

A list is given of successfully isolated strains and mention is made of the growth of *Mycobact. johnei* in association with *Mycobact. tuberculosis.* The virulence of seven of the isolated strains was assessed by g. pig inoculation.—J. M. Peters.

Šula, L. (1943). Der Nachweis der Tuberkelbazillen in der Tiefenkultur im flüssigen Nährboden nach Kirchner. **[Tubercle bacilli in deep liquid culture].**—*Zbl. Bakt. I.* (*Orig.*). **151.** 39–46. **205**

Comparative cultivation tests were carried out with *Mycobact. tuberculosis* of both human and bovine origin

on Kirchner's fluid medium and Dorset's egg medium. Kirchner's medium is a buffered solution containing neutral sodium citrate, asparagine, and glycerin to which 10% by volume of filtered human serum is added.

Fifty tests were made with each medium. *Mycobact. tuberculosis* was isolated 47 times on the solid medium and 45 times on Kirchner's medium. There was, however, no appreciable difference in the rate of growth and total quantity of culture produced. Within 10–20 days, a minute granular growth could be detected in the fluid medium resting on the bottom curvature of the tube. Fluid medium, in spite of the disadvantage that it is easily contaminated, the contaminants growing throughout the liquid, has the advantage of being suitable for inoculation with material previously treated with 10% H_2SO_4; the acid is dispersed in the fluid and does not remain adjacent to the inoculum as it does in solid media.—N. S. Barron.

Buxbaum, L., & Fiegoli, N. F. (1943). **Penicillin. Its use in media for the isolation of *H. influenzae* from laryngeal cultures in obstructive laryngitis.**—*J. Bact.* **46.** 543–547. **206**

Laryngeal material from 119 cases of obstructive laryngitis in human patients was cultured on a blood-agar medium containing crude penicillin at a concentration inhibitory to *Staphylococcus aureus* but not to *Haemophilus influenzae*, on blood-agar plates containing 5 ml. of 2% sodium oleate per 100 ml. agar, and on blood-agar plates alone. 48·5% of the last plates were positive for *H. influenzae*, in contrast to 86·7% of the penicillin plates and 80·8% of the sodium oleate plates. Despite the apparently similar recovery from the last two media, the small dew-drop colonies of H. *influenzae* were more discrete, more readily discernible, and in purer culture on penicillin than on sodium oleate medium, facilitating their removal for serological testing.
—A. B. Paterson.

Levin, M. (1943). **Two agar-less media for the rapid isolation of corynebacterium and neisseria.**—*J. Bact.* **46.** 233–237. **207**

Details are given of two methods for making solid media under field conditions. These methods would probably not be used in the better equipped or permanent laboratories.

Pig serum, preserved with chloroform 1 : 50, is used to replace agar. The medium is poured into clean, but not necessarily sterile, petri dishes and autoclaved. Full details are given for the manipulation of the autoclave, and it is claimed that these directions will prevent bubbling, fragmentation, and soft consistency of the medium.—J. E. Lancaster.

McIntosh, C. W., & Konst, H. (1943). **Preparation and standardization of johnin purified protein derivative.**—*Canad. J. publ. Hlth.* **38.** 557–563. **208**

Strains of *Mycobacterium johnei* adapted to grow on Long's synthetic medium were used to prepare the johnin. Ultrafiltration of the johnin by a method similar to that described by Seibert for the production of tuberculin P.P.D., removed substances which were found to be present when the johnin was prepared according to the technique used for Koch's old tuberculin. The yield of johnin P.P.D. was increased when the pH of the medium was changed from acid to alkaline before harvesting. Preparations of johnin P.P.D. varied considerably in potency, but this variation could be detected fairly accurately by biological assay on g. pigs sensitized by the intraperitoneal injection of calcium salts 48 hours before receiving the sensitizing dose of *Mycobact. johnei*.—J. L. Byrne (Canada).

Giroud, P., Giroud, M. L., & Meunier, M. (1943). **Méthode rapide permettant la séparation des rickettsies et de certaines bactéries des tissus qu'ils parasitent. [A rapid method for the separation of rickettsia and certain bacteria from infected tissues].**—*C. R. Soc. Biol. Paris.* **137.** 703–704. **209**

Rickettsia-infected tissue, macerated and shaken with oils or turpentine derivatives for a few minutes gave a product in which the cellular particles were suspended in the emulsion and the rickettsias concentrated in the subjacent fluid. Acid-fast bacteria were concentrated in the emulsion. When mixtures of Gram-positive and Gram-negative organisms were so treated, the latter are said to have been present in the deep layer of fluid.
—J. M. Peters.

Chalkley, H. W. (1943). **Method for the quantitative morphologic analysis of tissues.**—*J. nat. Cancer Inst.* **4.** 47–53. **210**

A method is described for measuring directly the volumetric or area ratios of components of tissues as viewed in the microscopic field.

The principle is based on the use of numerous hair threads attached to the microscope so that they appear in the focal plane of the image as a pattern of pointers. The element of tissue on which their points are focussed is noted and recorded. The object is then moved by use of the mechanical stage and brought back into focus at varying vertical levels. This process is repeated, following a fairly systematic pattern in all three dimensions and covering a sufficient portion of the tissue measured to give an adequate sample.—C. W. Ottoway.

Pollak, O. J. (1944). **A rapid trichrome stain.**—*Arch. Path.* **37.** 294. **211**

In this method the usual constituents of Masson's trichrome stain, combined into a single solution, are employed; it can be used after any of the standard fixatives. The staining method is very simple and rapid and the staining solution keeps well. The composition of the stain and the method of preparing it are described in detail.—E. G. White.

Bigger, J. W., Thomas, G. E., & Caldwell, W. G. D. (1944). **A modified slide cell.**—*J. Path. Bact.* **56.** 266–269. **212**

The bacteriostatic power of serum has now to be frequently determined in order to control the dosage of penicillin. In order to facilitate such a determination, a slide cell of some type is essential. The writers describe and illustrate a modification of a technique used by Fleming for the construction of slide cells, which has the advantage of simplicity for those not skilled in the production of such pieces of apparatus.
—J. G. Campbell.

Taylor, A. C. (1944). **Apparatus for the freezing-drying of tissues for storage.**—*J. Lab. clin. Med.* **29.** 657–663. **213**

Freezing-drying is a valuable method for the preservation of biological material in that the solvent, suspending fluid, or contained moisture of the material is evaporated off under vacuum from the frozen state, thus eliminating tissue distortion or protein denaturation due to concentration, which may occur if the material is dried from the liquid state. T. describes a dehydrating apparatus of low cost and simple design possessing an additional advantage in that dried tissues need at no time between desiccation and storage come into contact with air or moisture.

Vacuum is produced in a series of tubular vials, the orifices of which communicate with the lumen of a manifold containing phosphorus pentoxide trays, and connected by air-tight joints to a Cenco high-vac pump; the manifold is provided with a tap connected to a calcium chloride air dryer *via* which the vacuum may be relieved if desired. The bodies of the vials, which

contain the tissue to be desiccated, project from the manifold and are contained within a thermos flask (A) connected by two vents with a larger thermos flask (B) containing 15–20 lb. "dry ice" (solidified carbon dioxide). A is warmer than B and a current of cold air and carbon dioxide vapour circulates by convection between the two, thus reducing the ultimate temperature of A, which is controlled by means of a bimetallic thermostat operating a valve over the inlet vent from B to A.

The aseptic tissue to be dried is cooled in liquid nitrogen (B.P. –190°C.) transferred to the previously cooled vials, which are then connected to the manifold, and flask A is placed in position. The convection-cooling system is put into operation, followed by insertion of the phosphorus pentoxide trays into the manifold; connexion is established with the pump and the latter started. On completion of desiccation, the vials may be sealed off with an oxygen hand torch, either after filling with air or while still evacuated, the cooling chambers being first removed. A temperature of –40°C. is maintained within ±2°C. for 72 hours with 15–20 lb. "dry ice". For longer runs, 10 lb. "dry ice" are added every second day by simply disconnecting flask B. Most moisture in a small piece of tissue is removed within 48 hours, but even after prolonged runs it is difficult to remove the last 1% of moisture. This is also true of more rigorous freezing-drying procedure, and is of little consequence.—ALEX. B. PATERSON.

ANTOINE, L. D., & HARGETT, M. V. (1943). **Machine for shell freezing small volumes of biological preparations.**—*J. Bact.* **46.** 525–529. **214**

A description, with a photograph and diagrams, of a convenient machine for the preservation of biological products, such as vaccines, by a method of freezing and desiccation known as "shell freezing".—J. M. PETERS.

DUNOYER, F. (1943). Réalisation d'un appareillage d'ultrafiltration. **[An apparatus for ultrafiltration].**—*C. R. Soc. Biol. Paris.* **137.** 698–700. **215**

A description is given of a filter, mainly metal, which consists of a two-chambered barrel with centre joint where an interchangeable Jena glass disc and a gradocol membrane are supported on a metal flange; the joint is made tight by a rubber washer and an encircling metal screw. The material for filtration is introduced through an opening at one end of the barrel which is also connected to a compressed air supply. The filtrate is delivered by an opening from the lower chamber.—J. M. PETERS.

HIMMELWEIT, F. (1944). **A simple method for the aseptic dissection of mice.**—*J. Path. Bact.* **56.** 271–272. **216**

A technique has been evolved enabling the rapid removal of skin in such a manner that the risk of contaminating the muscular layers with surface organisms is almost entirely eliminated. A virtue of the technique is economy in the use of instruments. The technique can be readily adapted for the aseptic removal of the brain.—J. G. CAMPBELL.

RULE, C. (1944). **A simple auscultatory technique for the estimation of the blood pressure of dogs.**—*J. Lab. clin. Med.* **29.** 97–98. **217**

The method described is as follows:—a roll of semi-elastic "Ace" bandage, measuring 9 ft. × 2½ in. is stitched to the tail of the cloth cover of the cuff (30 in. × 4 in.) of the sphygmomanometer; the cuff is applied to the thigh of the dog, and the bandage wrapped around until every portion of the cuff is covered, and then secured by a few turns round the body; the diaphragm of a stethoscope is then inserted under the lower edge of the cuff, over the femoral artery, and the blood pressure recorded in the conventional manner.

It is said that a few trials will indicate for the individual animal the best position for the cuff and stethoscope. Results are stated to have compared well with those obtained by direct manometric measurements on the other hind limb, and to be in accordance with the values recorded by other authors using different techniques, *i.e.* of the order of 138 mm. Hg systolic and 79 mm. Hg diastolic pressure.

In experimental work, the value is emphasized of a routine method of estimating the blood pressure, since the presence of strangers or the occurrence of strange noises is said to provoke higher readings in some animals.—ALASTAIR N. WORDEN.

SEARS, P. D., & GOODALL, V. C. (1942). **Apparatus for the collection of urine and faeces from grazing sheep.**—*N.Z. J. Sci. Tech.* **23.** 301A–304A. **218**

The harness used for collecting samples of urine and faeces, separately, from grazing sheep is described and illustrated. The advantages of this type of collector over the rubber bottle and cup apparatus are discussed. A possible disadvantage is that for certain determinations a metal collector for urine as used here may not be as satisfactory as rubber, because of the reaction of urine on the metal container.—R. ALLCROFT.

THORP, R. H. (1944). **A box for holding rabbits for ear bleeding and other minor operations.**—*J. Path. Bact.* **56.** 270–271. **219**

T. describes and illustrates a rabbit box designed to eliminate the disadvantages associated with the usual type constructed of wood. This box is made entirely of galvanized sheet iron and is composed of two main interchangeable parts. It is claimed that injury to the rabbit is almost impossible, that ventilation is good, that the box is easily cleaned and sterilized, and that it will last indefinitely although the cost is only a little more than that of a well-made wooden box.—J. G. CAMPBELL.

SWANSON, E. W., & HERMAN, H. A. (1944). **A satisfactory method of shipping dairy bull semen long distances.**—*J. Dairy Sci.* **27.** 143–146. **220**

Cooled or partially cooled semen in an insulated, rubber-wrapped vial is placed in a vacuum flask of water at 40°F.; the flask is then put in a watertight metal can slightly larger than the flask and chipped ice is packed around it. To maintain the semen at correct storage temperature (35°–50°F.), it was found necessary to use a pint vacuum flask and a small amount of ice under winter conditions and a one-half pint flask with a maximum amount of ice in the same-sized can under hot summer conditions. The sealed can and its contents are finally packed in a small insulated ice-cream shipper. When the method described was used, satisfactory semen storage temperatures were maintained for 84 hours at an atmospheric temperature of 80°F. Results of inseminations with shipped semen requiring 48–72 hours in transit "were very satisfactory for stored semen".—N. J. SCORGIE.

See also abts. **12** (estimation of virulence of tubercle bacilli), **197** (preparation of precipitating sera for identification of meat products), **40** (cultivation of leptospira), **43** (electron microscopy).

MISCELLANEOUS

HESLOP, G. G. (1942). **Air raid precautions (animals) in Victoria.**—*Aust. vet. J.* **18.** 134–135. **221**

An account, given before the Victorian Division of the Australian Veterinary Association, of the A.R.P. (Animals) scheme which had been officially approved. The organization, which was part of the general A.R.P. service, was on a municipal basis and consisted of veterinary first aid and hospital centres, mobile veterinary units, and municipal detention and first aid posts. —D. A. GILL (AUSTRALIA).

HERSHBERGER, F. C. (1944). **History of the United States Army Veterinary Corps.**—*Cornell Vet.* **34.** 52–64. **222**

A chronological review is given on the more important events in the history of the U.S. Army Veterinary Corps.

Although farriers were first employed in the army in 1792, it was not until 1848 that the engagement of veterinary surgeons was authorized. For various reasons, however, very few veterinarians were employed and it was not until 1875 that any report or record was submitted by a veterinarian to the War Department.

The status of army veterinarians was unsatisfactory until 1901. Up to that time, graduate and non-graduate veterinarians were enrolled indiscriminately; no better rank than sergeant major could be attained, and resignations were frequent. Following the Spanish-American war, however, the American Veterinary Medical Association by a bill passed by Congress secured the relative rank of 2nd lieutenant for veterinarians and with it many other improvements. All non-graduate veterinarians were then retired. Veterinarians in the army were, however, still regarded as civilian employees up to 1916, when all army veterinarians were commissioned from 2nd lieutenant up to and including major. The veterinary corps of the National Army was established in October 1917.

At the beginning of the war of 1914–18, there were 72 veterinary officers in the service and no enlisted men. Within a year and a half, there were 2,313 officers and 16,391 enlisted men.

In 1918, the first army veterinary laboratory was organized in Philadelphia, moving later to Washington.

In 1920, a Regular Army Veterinary Corps was set up with rank authorization from 2nd lieutenant to colonel. In 1935, the grade of 2nd lieutenant was eliminated and veterinary officers were placed on the same grade basis as Medical and Dental Corps officers, *i.e.* entry as 1st lieutenant, with promotion to the rank of captain in three years, major in 12 years, lieutenant colonel in 20 years, and colonel in 26 years.

The first association of the veterinary corps with meat and dairy products inspection was in 1901 and this service has continued to expand up to the present time.

When the present war began, the veterinary corps consisted of 126 officers and 590 enlisted men. Great increase has occurred since that time, but actual numbers cannot yet be revealed.—D. D. OGILVIE.

ARUNDEL, H. F. (1944). **The veterinary services of the United States Army.**—*Vet. Rec.* **56.** 217. Discussion pp. 217–218. **223**

The Veterinary Corps of the U.S. Army is part of the Medical Department which consists of the Medical Corps, Veterinary Corps, and Dental Corps. The duties of the Veterinary Corps are twofold, *viz*, the care of Army animals and the supervision of food supplies of animal origin intended for the Army. The Corps is responsible for the health and management of Army animals; all animals are examined and approved by officers of the Veterinary Corps before purchase by the Army. The Veterinary Corps also investigates the quality and condition of all meat and dairy produce at purchase, during storage, and prior to issue. It is also responsible for the inspection of milk herds and dairies. Routine monthly examinations are made of all cows in herds supplying the Army; milk is purchased only from herds free from TB. and as an additional safeguard it is pasteurized before issue.—D. D. OGILVIE.

KELSER, R. A. (1943). **The Army veterinary service.** —*J. Amer. vet. med. Ass.* **103.** 357–363. **224**

There has been considerable expansion of the U.S. Army Veterinary Corps since the beginning of the present war. This has been made necessary mainly by the requirements of the food inspection service, but also by the acquisition of large numbers of dogs for military service and by a moderate increase in the horse and mule complement of the army.

All army horses and mules are immunized against equine encephalomyelitis and tetanus. Preventive and control measures against glanders have reduced this disease to negligible proportions in army animals abroad.

The veterinary corps is responsible for procuring, handling, and inspecting all meat, meat-food, and dairy products for the army. Despite the fact that these classes of food are the most vulnerable to contamination and spoilage, no serious outbreaks of disease have resulted from their use at any military centre.—D. D. O.

—. (1940). Como é executada no Brasil a defesa sanitária animal. **[Animal health services in Brazil].** —*Bol. Minist. Agric., Rio de J.* **29.** No. 11. 70–71. **225**

The Division of Animal Health of the Brazilian Ministry of Agriculture functions through nine regional departments in the principal states. In addition, there are three centres dealing with the prevention of rabies. During the first half of 1940, 300,793 cattle were vaccinated against rabies. The incidence of rabies in cattle is steadily decreasing. The laboratories of the Animal Health Division sold 794,025 doses of vaccine against anthrax, blackleg, and calf scours in the same period, and its inspectors administered 1,103,700 doses of the same products in the same period. The Division carries out educational and clinical work by visits to breeding establishments. During the first six months of 1940, 23,287 railway waggons were disinfected under the supervision of the Division.—MILLER WATSON.

—. (1940). 50 År Skandinaviska Kreatursförsäkringsbolaget 1890–1940. **[Publication on the occasion of the 50-year jubilee of the Scandinavian Animal Insurance Company, 1890-1940].** pp. 200. Uppsala: Almquist & Wiksells Boktryckeriaktiebolag. **226**

This jubilee publication contains a wealth of information on animal breeding in Sweden and the history of livestock insurance there, which dates from 1850. The S.K.F.B., the company publishing this book, was founded in 1890 and by 1940 had absorbed about 100 smaller concerns to become the leading one in the country, although several local companies are also still in operation. In 1940, a quarter of a million horses, the same number of cattle, 10,000 pigs, sheep and goats, 4,000 dogs and 750 foxes were insured. Losses sustained over a long term of years are reported in tables and illustrated by graphs, one of which shows the close connexion between outbreaks of foot and mouth dis-

ease in Sweden and in Sjaelland, Denmark, during two periods of epizootics, 1924–27 and 1938–40.

About half the book is devoted to special articles by commissioned experts on thoroughbred horse breeding in Sweden, the north Swedish breed of horses, the Swedish Ardenne breed of horses, livestock shows in Sweden, and certain veterinary subjects.

SWINE FEVER OUTBREAK IN SWEDEN IN 1940, by A. ALEGREN.—After Sweden had been free from swine fever since 1929, infection was imported in pig carcasses into Göteborg in January 1939, the country of origin being unknown as at that time all European countries except the Scandinavian ones were infected with the disease. During January, eight herds in the proximity of Göteborg became infected. Slaughter with State compensation was ordered as soon as the diagnosis of S.F. was verified in mid-February, but in May a great "flare-up" took place, mainly in Kalmar province in the south-eastern part of Sweden; also a few infected farms were found in other provinces including Stockholm province. Appropriate State control measures enabled the disease to be quickly controlled and finally eradicated in July at a total State cost of Kr. 100,000, 594 pigs having died naturally from the disease and 2,645 having been slaughtered. It was established that a total of 217 herds became infected, 43 by the use of infected foodstuffs and 145 by the introduction of infected live pigs. The incubation period was studied and found to vary from 2–18 days.

AVITAMINOSIS B IN DOMESTIC ANIMALS, by B. CARLSTRÖM.—A review is given of the author's views, together with a résumé of the various classical examples of B avitaminosis in domestic animals and man.

DISEASE FREQUENCY IN HORSES OF DIFFERENT AGES, by K. ERIKSSON.—This is a dissertation on data collected from the S.K.F.B. statistics on equine mortality. Apart from a relatively high mortality among newborn foals (3–5·5% in different year groups of the firm's operations), the death rate rises steadily from about 1% in two-year-olds to 4% in horses 15–18 years old, and then falls off sharply, *i.e.* few horses survive beyond the ages of 15–18. It was determined that insured horses in Sweden born between 1920 and 1926 were as a group a poor risk as they had a much poorer survival power than horses born in other years. The cause of this is discussed, but it could not be traced to any one reason.

EXPERIENCES CONCERNING THE CAUSES OF IMPOTENCE IN BULLS, by G. FORSSELL.—It has been recorded that one-fifth to one-third of all insured young bulls of three Swedish breeds are incapable, within the first few months after sale, of serving cows. F. has a long experience of such cases and here gives his experiences, which lay the cause chiefly on mismanagement by the purchaser and to a smaller degree on the breeder of the animals. Nine rules for the management of bull calves, young bulls, and breeding bulls are given.

EQUINE INFECTIOUS ANAEMIA, by A. HJÄRRE.—This disease has a stationary geographical distribution in Sweden, being most prevalent in the north. The loss in the three principally affected provinces of Norrland, Kopparberg, and Värmland averages 300–400 horses annually. The disease occurs in moist localities where the herbage is poor in calcium and rich in manganese. There appear to be two types of anaemia, *viz*, the virus disease and a so-called "nutritional anaemia" which is probably a form of avitaminosis B_1, although research on the interaction of excessive manganese and vitamin B_1 is not yet complete.

Much work has been done on the theory of insect transmission, and some circumstantial evidence has been obtained that simuliids may act as transmitters of the virus anaemia. Diagnosis is difficult. The most reliable method is the inoculation of suspected blood into susceptible horses, but this is, of course, generally impracticable. Haematological tests give at best suggestive results and more reliable evidence is furnished by Wall's liver sampling test for evidence of changes in cells of the reticulo-endothelial system. H. states that the disease could to advantage be named "infectious reticulo-endotheliasis". The best form of control, which does not at present exist in practice, is notification and slaughter of all cases.

RESEARCH ON TYMPANITES IN CATTLE AT PASTURE, by S. HOFLUND.—Much information was collected from the S.K.F.B. records and from replies to a questionnaire sent by H. to owners of cattle which had died of the disease. Over a 15-year period an average of 334 insured cattle in Sweden died annually of tympanites, a figure equal to 0·03–0·26% of the total number insured. Geographical distribution appeared to be connected with the existence of quick-growing clover or aftermath, combined with a short annual grazing period. August and September are the months in which there is the greatest incidence of cases and the times of day when most cases occur are the morning with a peak at 10.00 a.m. and the afternoon with a peak at 4.00 p.m. The gases giving rise to tympanites are CO_2, CH_3 and H_2S in that order (with traces also of other gases): gas production occurs concurrently with a rumen content low in protozoa and high in bacteria and with an acid pH. It is probable that greedy and rapid ingestion of the lush fodder with which is associated a continued holding of the head low down at ground level play an important part in the genesis of gas formation in the rumen. The gas may lie free in the upper part of the rumen or may be evenly dispersed among the ingesta. The former is relatively easily relieved by belching, but the latter is not.

Tympanites is commonest in yearlings and less common as age increases, and it is far more frequent during the first three days on pasture than later. Red clover is more dangerous than alsike or white clover. Manuring or fertilizing of the pasture, especially with phosphates, is an important contributory cause of tympanites, which was most common on medium warm soil with medium rainfall.

PIROPLASMOSIS IN SWEDEN DURING 1925–38, by M. LAGERLÖF.—This is a detailed account, accompanied by graphs and tables, of bovine piroplasmosis. The annual number of cases has apparently risen during this period from about 5,000 to 9,000, but it is probable that cases have recently been reported to a greater extent than previously. The mortality rate has fallen from 15% to about 8%, a result reflecting the improved methods of control and treatment. Better care of pastureland, with the clearing away of scrub and coarse grasses, has reduced the tick population and advances in therapy have also been made. Up to 1928, trypan blue was mainly used for treatment, but results were not very good. In 1928, ichthargan was suggested by HINDERSSON at the Third Scandinavian Veterinary Congress [see *3. nord. Vet.-møte Oslo, 1928*. pp. 192–209.] and was increasingly used in succeeding years, giving better results than trypan blue. In 1936, acaprin appeared: it is very effective but had had no time to influence the mortality statistics during the period under review. In very severe cases no drug will cure the condition, and blood transfusion is necessary to save life; the latter is being increasingly employed.

In conclusion, it is perhaps of interest to observe that the insurance principle has been developed in extraordinarily close (relative to other countries) co-operation with the veterinary profession in Sweden, with the result that the influence of veterinary opinion has been brought to bear to a much greater extent than

is usually possible in connexion with livestock disease. This considerable publication is evidence of it and may point a very valuable way of disease control to other countries in which working connexion between livestock insurance and animal health work is less than is desirable.—J. E.

REPORTS

—. (1944). **Department of Agriculture for Scotland. Report of the committee on hill sheep farming in Scotland.** pp. 127. Cmd. 6494. Edinburgh : H.M. Stat. Off. [8vo] [2s.]. **227**

The committee operated under the following terms of reference, *viz*, to investigate the present position of hill and upland sheep farming, especially with regard to improving the condition of the grazings, the health and hardiness of the sheep, the stocking and management, and the methods of marketing.

The report is presented in six parts dealing with history, hill-sheep farming today, the economic plight of the industry, the general condition of the industry, the task of reconstruction, and a long-term policy.

Disease is regarded as of major importance in the economic losses sustained by the hill farming industry. There are indications that disease losses have increased recently.

A summary of the occurrence of various diseases is given on a geographical basis. In answer to a questionnaire, farmers described the most serious diseases of their flocks as louping-ill, braxy, lamb dysentery, liver fluke infestation, blowfly strike, "pining", and tick-borne fever.

The committee regard the sheep diseases of outstanding importance and widespread prevalence in Scotland to be :– those transmitted by ticks, *viz*, louping-ill, tick-borne fever, and pyaemia of lambs ; those due to clostridia, *viz*, braxy, lamb dysentery, pulpy kidney disease, and enterotoxaemia ; helminth infestation of the alimentary tract and liver fluke ; blowfly infestation ; "pining" (in the Hebrides and Solway area), and scrapie in Cheviot and Border-Leicester sheep.

The availability of successful methods of controlling most of these diseases is stressed, together with the difficulty in obtaining the services of practising veterinary surgeons on hill sheep farms. In dealing with the problem which is presented, the committee emphasize that two of the essential requirements are the stimulation and development of research on disease and the development of veterinary services.

The main disease problems requiring attention are infestation with the common sheep tick (*Ixodes ricinus*), blowfly strike, helminth infestation, "pining", tick-borne fever, pyaemia in lambs, louping-ill vaccination, scrapie, pregnancy toxaemia, enzootic abortion, photosensitization, and nutritional deficiencies.

The establishment of a Hill Farming Research Station is advocated so that many of the problems can be studied where they occur.

Examination of the existing veterinary services shows that these are inadequate to deal with the situation. The committee therefore recommends the setting up of a whole-time State veterinary service. It is realised that this recommendation raises the question of the future position of the Animal Health Division of the Ministry of Agriculture in relation to scheduled diseases in Scotland and it is recommended that this should be considered in relation to the special service which is advocated.—D. D. Ogilvie.

I. Blackburn (County Borough). (1942). **[Report on] Food supply [1941].**—*Rep. Hlth Blackburn, 1941.* pp. 6–8. **228**

II. Blackburn (County Borough). (1943). **Annual report upon the health of Blackburn for the year 1942.** [Thierens, V. T.] pp. 16. [fcp] [Mimeographed]. Items of veterinary interest pp. 5–7. **229**

III. Preston (County Borough). (1943). **Report of the Medical Officer on the Health of the borough for the year 1942.** pp. 39. Preston : R. Seed & Sons. [4to]. Items of veterinary interest pp. 25–27. **230**

IV. Staffordshire (County). (1942). **[Report on] Milk supply [1941].**—*Rep. med. Offr Hlth Staffs., 1941.* pp. 42–48. **231**

V. Staffordshire (County). (1943). **Annual report of the Medical Officer of Health for the year 1942.** pp. 72. Items of veterinary interest pp. 39–40, 44–45 & 47–53. Stafford : J. C. Mort Ltd. [8vo]. **232**

I. Out of 29,398 animals sold for slaughter, 846 showed lesions of Tuberculosis and 322 further carcasses were condemned for other diseases.

II. 36,753 animals were sold for slaughter ; 903 showed lesions of Tuberculosis and 206 lesions of other diseases.

III. There were 18 cowkeepers with 465 cows in the borough, selling 602 gallons of milk daily. Six herds were accredited. Quarterly examination of the cows is carried out. About 230 milk samples were examined ; tubercle bacilli were found in 18 samples of ungraded milk and coliform bacteria were present to excess in 93 such samples. Seven tuberculous cows were slaughtered under the law relating thereto. Meat and other food markets are regularly inspected as well as slaughtered stock. 1,270 cattle, 61 pigs, and 112 sheep carcasses or parts thereof were condemned.

IV. Tubercle bacilli were found in 55 of an unstated total number of ordinary milk samples and in three out of 259 samples of designated milk (two in pasteurized and one in accredited milk). 2,596 farmers in the county were licensed to produce accredited milk and 36 to produce tuberculin-tested milk.

V. Tubercle bacilli were found in ten samples of milk from accredited herds, three of pasteurized milk, and one from a tuberculin-tested herd, and in 38 samples of ordinary milk examined in circumstances not specified. 2,554 farmers in the county were producing accredited milk and 44 T.T. milk.—J. E.

Canada, Manitoba. (1943). **Report on crops, live stock, etc. produced in Manitoba in 1943.** pp. 55. Items of veterinary interest p. 13. Winnipeg : Department of Agriculture. **233**

Statistics of livestock and crops in Manitoba are given ; there is little data on diseases of animals or poultry. There were 356 flocks free from Pullorum Disease and 365 flocks with 1% or fewer reactors to the pullorum test ; a new record was established in the 1,394 flocks inspected, totalling 330,161 birds banded and blood-tested for pullorum disease. The Provincial Veterinary Laboratory examined 777 specimens of diseased birds with the following results :– digestive diseases 171 cases, respiratory diseases 26, infectious diseases 309, nutritional diseases 42, and miscellaneous causes 148 ; the remaining 81 birds examined were turkeys.—J. A. Griffiths.

Ceylon. (1943). **Administration report of the Acting Director of Agriculture for 1942.** [Rodrigo, E.] pp. D 16. Items of veterinary interest pp. D 8–D 13. Colombo : Govt. Printer. [8vo] [35 cents]. **234**

There were 256 deaths from Anthrax ; 200 of these were among goats in quarantine after importation

from India. Anthrax spore vaccine was used for protecting in-contacts. Nineteen deaths from BLACKLEG were reported from Uva among unvaccinated animals. Twenty-two cases of HAEMORRHAGIC SEPTICAEMIA were reported. Three cases of BOVINE TUBERCULOSIS were detected at the Colombo abattoir, and three others were found in the herd from which the three infected animals originated.

2,111 cases of FOOT AND MOUTH DISEASE were reported, with only one death. Sixty-six cases of RABIES were reported and 78,293 stray dogs were shot. The Pasteur Institute found 293 positive cases among 605 brains examined. Thirty-five goats and 20 cattle were found to be infected with RINDERPEST on importation from India ; six of the goats died and 29 were slaughtered, and also all in-contact cattle. Forty-five cases of PLEURO-PNEUMONIA occurred among goats in quarantine on importation from India.

A new laboratory building was occupied at the beginning of the year. 888 specimens were examined. 6,880 doses of FOWL-POX vaccine were prepared. Some artificial insemination of cattle was carried out ; 30 calves were born as a result of 52 inseminations. Some investigations were made on Newcastle disease in an attempt to find an efficient method of immunization. Attempts to attenuate the virus by serial passages through white mice and g. pigs failed. A potent serum was obtained from fowls and turkeys, but the cost was prohibitive. It was not possible to obtain an immune serum from goats. The use of sulphapyridine had no curative value. In studies on POSTERIOR PARALYSIS of goats, feeding of the suspected plants (*Pothos scandens*, *Smilex zeylanica*, *Epaltes divoricata*, *Calotropis gigantea*, *Pavatta* sp., and *Lantana camara*) to healthy goats did not cause the disease ; histological examination of the spinal cord and sciatic nerve of diseased goats, stained by Marchi's method, showed massive demyelination.

A total of 2,146 cattle and buffaloes and 33,973 sheep and goats imported from India were dealt with in the Government quarantine stations.

Government dairies in Colombo are under the management of the Veterinary Division.—J. A. G.

ST. LUCIA. (1942). **Report on the Department of Agriculture, 1941.** pp. 12. Items of veterinary interest pp. 5–6. St. Lucia : Govt. Printing Off. [fcp] [6d.] **235**

Livestock have become important to the Colony with the increased demand for meat locally, following a rise in prosperity of the working classes since the establishment there of two U.S.A. Air Bases. The export of all livestock had to be stopped and measures were taken to prevent the slaughter of breeding stock. Local supplies of animals are insufficient to meet the demand for slaughter stock.

An epizootic outbreak of SWINE FEVER caused a loss of 90% of the pigs. There is no previous history of an outbreak of the disease ; the source of the outbreak was not ascertained.

The general conditions of the pastures are not suitable for maintaining livestock throughout the year and supplementary feeding is necessary.

There is no veterinary staff, but a short visit was made to St. Lucia by the Senior Veterinary Officer of Trinidad.—J. A. GRIFFITHS.

U.S.A., PANAMA. (1944). **Annual report of the Gorgas Memorial Laboratory, 1943.** [CLARK, H. C.] pp. 22. Items of veterinary interest pp. 15–18. Washington, D.C. : U.S. Govt. Printing Off. [8vo]. **236**

The institution carries out research on diseases of man and animals in the Panama Canal Zone. The central laboratory which is in Panama City has three field stations :– (1) one for malaria control, (2) an entomological station, and (3) one called a " veterinary station ".

The main function of the " veterinary station " is to breed small animals for the laboratory. Difficulties in obtaining fodder have necessitated a reduction in the number of animals maintained. There was no veterinarian on the staff during the year.

In the report of the protozoologist (JOHNSON, C. M.) mention is made of the use of sodium carbarsone in the treatment of equine and bovine TRYPANOSOMIASIS, but no details are given. A pathogenic *Toxoplasma* sp. was isolated from sick army carrier pigeons. This organism is being maintained in g. pigs for further study. In the pigeons, the disease was characterized by sudden onset, high temperature, extreme weakness, and often generalized convulsions. In many instances the disease was rapidly fatal ; recovery in others was slow, accompanied by difficulty in maintaining balance when walking, the head being held on one side and the wing of the same side drooping. In sections of the brain, spinal cord, and nerves, there were granulomatous lesions like those found in Chagas' disease. The parasites are intracellular and were seen in the cytoplasm of a variety of cells associated or unassociated with the lesions. The parasites were sometimes found in the lungs, kidneys, spleen, heart, and liver. There was also extensive invasion of the nerves by the parasite, with the production of inflammatory lesions. It is suggested that, owing to difficulties in diagnosis, the role of this parasite as an important pathogenic agent in man and other animals, as well as in birds, has been overlooked.

An investigation of the epidemiology and control of diseases of domestic animals is being carried out by a military mission, under Colonel H. S. EAKINS of the U.S. Army Veterinary Corps. Laboratory facilities and office accommodation were provided at the Gorgas Memorial Laboratory. 2,061 thick blood smears were examined ; *Trypanosoma hippicum* was observed in 63 smears from horses and *T. vivax* in 47 from cattle. Piroplasms were present in 49 smears from horses and in eight from cattle, while in eight from horses and two from cattle microfilariae were found. *Dermatobia hominis* [= *D. cyaniventris ?*] was found to cause a dermal myiasis in cattle which is of considerable economic importance.—J. A. GRIFFITHS.

BOOK REVIEWS

NEWMAN, T. [President of the Poultry Association of Great Britain]. (1944). **Principles and practice of poultry husbandry.** pp. vi+148. 8 figs., 20 plates, 1 chart, 3 tables. Woking, Surrey : S.P.B.A. Supplies Ltd. [8vo] [4th Edit.] [3s. 6d.] **237**

This book is written primarily for the layman interested in poultry and intending to rear them on a comparatively small scale. Only 23 pages are devoted to the various diseases of poultry and the information given is inadequate even for a book of this type.

—J. D. BLAXLAND.

—. (1944). **War-time information for pharmacists.** pp. 81. London : Pharmaceutical Press. [3rd Edit.] [8vo] [1s. 6d.] **238**

This is the third edition of a very useful summary of Acts and Orders issued since the beginning of the war up to March 31st, 1944 which have a bearing on pharmacy. Many other pharmaceutical matters of war-

time interest receive attention. On general grounds, one omission is evident, *viz*, although reference is made to veterinary pharmaceutical matters such as the treatment of cattle warbles by nicotine sulphate solution, and details are given of the conditions of reservation of medical and dental students, of the restrictions on supplies of rubber gloves, overall clothing etc. to doctors and dentists, and of the addresses of such bodies as the "British Medical Association" and the "British Dental Association", no reference is made to the analogous veterinary items.

The following are of comparative interest.

Alcohol-saving order.—In order to save alcohol, authorized alternatives are given for a number of spirits and tinctures.

Economy in bactericides.—An appeal is made for the greatest possible economy to be exercised in the use of disinfectants and antiseptics which generally are in short supply. Heat sterilization should be substituted when available. Boric acid is also in short supply and it is advocated that, except for eye lotions, physiological saline should be used instead.

Treatment of burns.—The changes in the treatment of burns since the outbreak of this war are discussed. It is now generally agreed that tannic acid should not be used on large burns owing to the danger of toxicity. Minor burns can be treated with tannic acid, isotonic saline, or sterile petroleum jelly. Large burns are treated either with a coagulating solution comprising, for example, crystal violet, brilliant green and proflavine, or by a sulphonamide cream such as Glasgow No. 9 comprising cetyltrimethyl ammonium bromide (cetavlon) and sulphanilamide in a special vehicle.

Cod liver oil.—All supplies of fish liver oil for veterinary use are now manufactured under the direct control of the Ministry of Food. A special licence is required to pack veterinary oil which is now known as Ministry of Food Veterinary Cod-Liver Oil Mixture.

Animal feeding stuffs.—The latest regulations set up specifications for National animal food and require National Pig Food No. 1 to contain at least 1% of cod liver oil or a potency of 100 I.U. of vitamin D per gramme.

Treatment of lice.—Head lice in human beings can be killed either by soaking the hair in phenol solution 1 : 40 for an hour, or by the application of lauryl thiocyanate or lethane 384 in oil. Lethane 384 contains *n*-butylcarbinol thiocyanate 6·25% and thiocyanethyl laurate 18·25%.

Treatment of scabies.—The Ministry of Health recommends that when treatment of human beings for scabies can be carried out by a trained person, 25% benzyl benzoate emulsion N.W.F. should be employed. Other preparations recommended are solutions of sulphurated lime, a mixture of equal parts of liq. calcis sulph. and linseed oil, betanaphthol ointment, balsam of Peru in glycerin, ung. pot. polysulph. B.P., and a mixture of equal parts of soft soap, benzyl benzoate, and rectified spirit. Recently treatment with tetraethylthiuram monosulphide has been reported to be highly efficient as a sarcopticide.

Treatment of shock.—The Ministry of Health now advises the intravenous injection of sodium lactate or bicarbonate in crushing injuries in order to obtain alkaline urine and prevent venal damage. Sodium bicarbonate should also be given by mouth.

Sterilized sulphanilamide.—Sulphanilamide can be sterilized by dry heat at 150°C. for one hour in a paraffin bath or electric oven and by autoclaving in a dressings sterilizer by a special technique.

Vitamin A in capsules.—Capsules of halibut liver oil are now standardized to contain 4,500 I.U. vitamin A activity. Capsules liq. vitamin A et D conc. N.W.F. now contain 4,500 I.U. vitamin A and 450 I.U. vitamin D in 3 minims of an oily medium.

Treatment of warbles in cattle.—The use of nicotine sulphate solution prepared by mixing 2 fl. oz. of 40% nicotine sulphate solution, 1 lb. of hydrated lime, and 1 gal. of water is advocated. Dispensing should be done within one hour of use. [See, however, *V. B.* **13.** 372, absts. 2496 & 2497.]—D. D. OGILVIE.

SEIFFERT, G. (1944). **Virus diseases in man, animal and plant.** pp. ix+332. 7 figs. New York: Philosophical Library. [8vo] [31s. 6d.]. **239**

This work is divided into two parts. The general section gives an account of the nature of viruses and discusses elementary bodies, size of particles, filtration, cultivation etc. The special section deals with individual diseases caused by viruses.

The author, who has endeavoured to analyse the progress made since 1918, has given a useful outline of the trends of modern research. Unfortunately, no reference is made to articles appearing after 1937, and in this respect the book is already considerably out of date. The section on the nature of the viruses is adequate, but the remaining part of the work is uneven. Such diseases as influenza and equine encephalomyelitis are covered in sufficient detail, but in general the descriptions of the virus diseases of animals are poor.

The translation from the German into English leaves much to be desired.—R. E. GLOVER.

DAVSON, H. [D.Sc., Associate Professor of Physiology at Dalhousie University, Canada], & DANIELLI, J. F. [D.Sc., A.I.C., Beit Memorial Research Fellow]. (1943). **The permeability of natural membranes.** pp. x+361. 73 figs. Cambridge: University Press. [8vo] [25s.] **240**

The group of problems covered by this book is of outstanding interest and importance in fundamental biology. The problems, however, are difficult and the whole field is rather confused. The work of OVERTON at the end of the last century tended to give too simple a picture of the cell membrane. Since then many new facts have been found which have complicated and modified the original idea of the cell membrane as a lipoid layer. The field is still very fluid as is illustrated by the fact that the important paper of BOYLE & CONWAY [(1941). *J. Physiol.* **100.** 1–63.], which modified the views of muscle permeability, was published too late for consideration in this book.

A great deal of the work on permeability of natural membranes has been carried out on mammalian erythrocytes and on plant cells, and this is described, discussed and criticized in the book. The membranes of different tissues and indeed of the same type of cell in different species vary in their behaviour so that it is difficult to apply the results obtained with one particular type of cell to cells of other tissues which may be of greater interest to students of general physiology, nutrition, and pharmacology. Of the 31 chapters in the book under review one is devoted to the kidney, while the penetration of substances through capillaries and into intestinal mucosa, muscle, and nerve is discussed in different chapters.

Within the limitations of the subject the presentation is clear and an attempt is made to obtain a detailed understanding of underlying mechanisms. It is to be regretted that there is no author index and that the authors' initials are not given in the references.

—E. BOYLAND.

See also abst. **162** (annual review of biochemistry).

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